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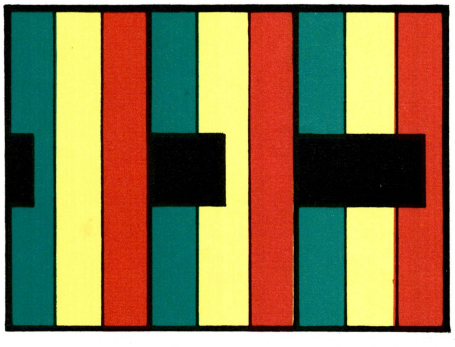
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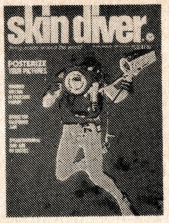
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skin diver





54/Million $ Find



68/Holdup



78/Night Stalking

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Cover — Photographer Jack Drafahl was not pleased with the original slide of this diver with Niko-Mar camera and Subsea strobe, so he used the photographic art of posterizing to create our exciting cover print. Any slide, whether it's out of focus, off color or scratched, can be used for posterization. For step-by-step instructions in how to do it, see story on page 42.

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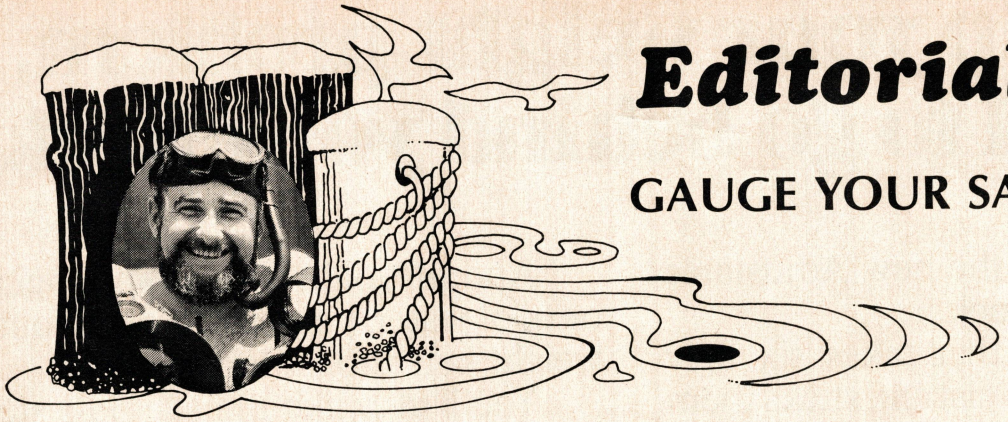
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Editorial

GAUGE YOUR SAFETY MARGIN

By The Publisher

Would you start a drive across the Sahara desert in an automobile that didn't have a gas gauge? Would you knowingly climb into an airplane that didn't have a fuel gauge and begin a trans-Pacific flight? The answers to these questions are obvious. Traveling blindly on questionable amounts of fuel is far too risky a proposition . . . even for the most experienced navigator.

Yet in diving, we still see evidence of a great number of scuba enthusiasts who steadfastly ignore the modern technology which surrounds them. They continue to dive without submersible pressure gauges in the face of mounting evidence that running out of air is one of the major causes of scuba accidents.

Studies by the Los Angeles County Underwater Safety Committee, the University of Rhode Island Scuba Safety Investigators, and the NAUI Diving Accident Investigation Project have all provided accident data which indicates the lack of a submersible pressure gauge to be the primary contributors in many diving deaths. In the April '74 SDM, Ralph Singer very clearly stated that 35 to 45 percent of the 100 diving deaths he personally reviewed might never have occurred had the victims been using such gauges. He also found that of the 300 "near miss" accident reports he reviewed, an incredible 55 percent of the cases related to the "running out of air" syndrome. Far too many divers are playing Russian Roulette with their scuba tanks . . . having little or no knowledge of the amount of air supply in their tank at any given time underwater.

Why such resistance toward using submersible pressure gauges? Let's take a moment to examine some of the weak sister excuses offered by the anti-gauge divers:

COP-OUT #1 — Many divers protest the submersible gauge is too expensive; they can get by without it. This is the old poverty plea, but it doesn't wash. If a man can afford to buy a scuba tank and regulator, he certainly can afford a submersible pressure gauge. It should be considered basic scuba gear, just as vital as a regulator mouthpiece or tank harness.

COP-OUT #2 — Some divers view the SPG as a nice-to-have accessory, which they may purchase later on . . . in a year or two. This is also bad reasoning. The submersible pressure gauge is most valuable to a diver in the beginning, when he has the least experience and is just about to embark on his first 10 or 20 open water dives. No sense buying the fire extinguisher after the house burns down.

COP-OUT #3 — Many divers place absolute faith and dependence on the J-valve . . . a very dangerous move indeed. J-valves and sonic warning devices are excellent safety back-ups, in case a diver should become engrossed in his marine environment and forget to check his air supply. However, they are no substitute for the submersible pressure gauge, which lets the diver constantly monitor his air supply. There is a vast difference between prevention and alarm devices. Having both is great, but substituting one for the other could prove fatal.

COP-OUT #4 — A few divers and instructors claim the SPG's are unreliable and tend to leak or fill up with water after a short while. Some of these comments are based on early gauge models made years ago, which did in fact, suffer mechanical problems. There's been a tremendous improvement in gauge manufacturing technology recently, and today's gauges are just as reliable as today's J-valves. The difference between the two is that a malfunctioning gauge is immediately visible to the diver and he doesn't have to wait until the end of the dive (when his air is exhausted) to discover there's a problem.

This dangerous practice of self-deception and illogical rationale on the part of the non-gauge user is due partly to his lack of knowledge and partly due to the diving industry's reluctance to fully embrace the importance of the SPG. Like the diver himself, manufacturers, scuba instructors, and store owners continue to condone the use of regulators without gauges. It's no wonder the diver remains unconvinced.

Lip service is not enough. We need a total commitment on the part of the diving industry if we are to successfully reduce the number of diving deaths in the U.S.

Here are a few steps which could greatly affect public attitude toward submersible pressure gauge usage:

a) Manufacturers should begin to package and ship every regulator complete with a gauge. Catalogs, order forms, and advertisements should show the regulators with gauges. The day of the "accessory" label is gone.

b) Scuba instructors should insist that *every* regulator used for training be equipped with a gauge. Granted, this means extra cost and maintenance, but isn't safe diving the ultimate goal of instruction? Basic scuba class is where the new diver forms his first (and often most lasting) impressions.

c) Store owners should display all regulators with gauges attached, and they should make a special effort to discourage the sale of a regulator without one. All rental regulators should also be equipped with gauges.

d) Submersible pressure gauges should be made mandatory for participation in all weekend dive boat trips, vacation dive tours, and other organized dive activities.

If we are going to place people in an alien environment where their air supply is the only thing standing between life and death, we had better insist these people be properly equipped to gauge their margin of safety.

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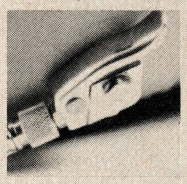
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Driftwood

. . . I agree with Anne B. Russell that divers should have some sort of medical identification on them when they are diving.

I wear a Medic Alert bracelet that tells that I am a scuba diver and my blood type. There is also an I.D. number and a phone number that can be called collect anywhere in the world 24 hours a day to find out any more information about me. These bracelets fit very well under a wet suit, so well that I forget that I even have one on!

Medic Alert is a non profit, charitable organization. The bracelets come in stainless steel, sterling silver, and gold. Anyone wanting further information can write to the following address: Medic Alert Foundation, P.O. Box 1009, Turlock, Ca. 95380.

KIT WEINRICHTER
MENLO PARK, CA.

. . . I am taking on a task of trying to set up a directory of divers, instructors, shops and dive locations in Kentucky. I will make a list of these items and upon completion make them available to the public.

BUDDY KNIGHT 602 NORWOOD DR., RICHMOND, KY. 40475

. . . Amazing is the only word I can use to describe my reaction to your article on teaching delinquents scuba. I was under the impression that we were the only ones doing it.

We have had a scuba instructor program at the Illinois State Training School for Boys, St. Charles, Ill., for several years now. Though not having the ocean for our open water dives, we have managed reasonably well with the lakes and quarries in the area.

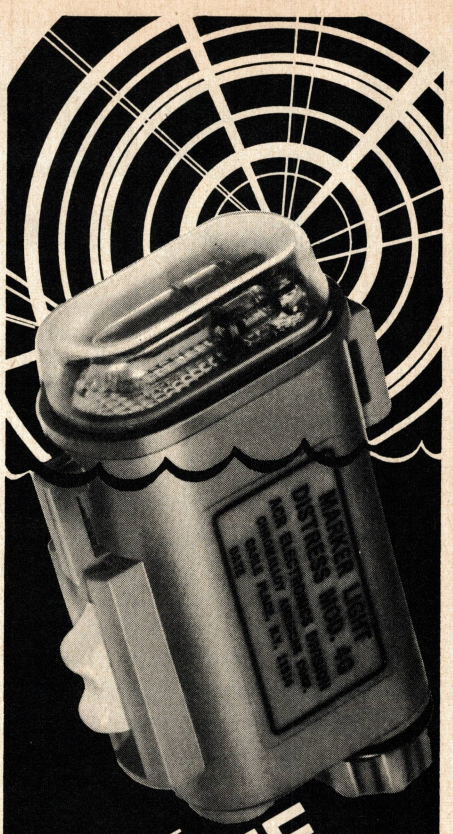
Our instructors are furnished through the Tri-City Youth project and community youngsters, as well as our students participate. This not only gives our students skills in scuba, but community exposure as well.

JERRY DYKHUISEN ASSISTANT DIRECTOR, UNIT II
ILL. STATE TRAINING SCHOOL FOR BOYS

. . . I have only been on the wreck ("Coin Pile"—July 73 SDM) four times, but I noticed several clues which might help identify the vessel or vessels.

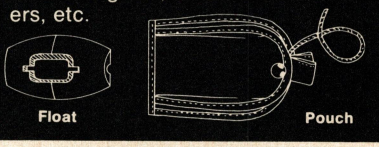
The wreckage is spread over several hundred yards along the north breakwater, and there is a considerable age spread in the artifacts; e.g., from dead-

(Continued on Page 11)



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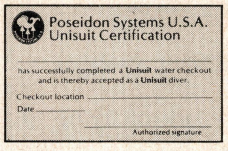
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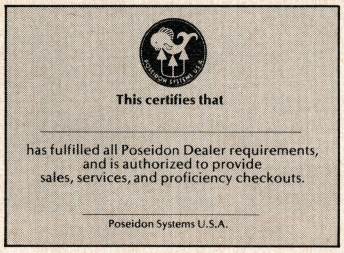


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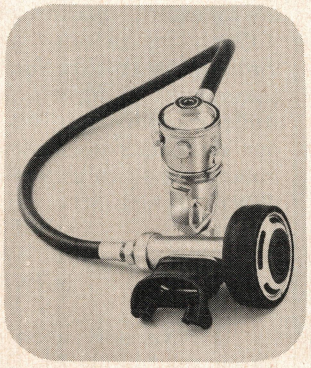
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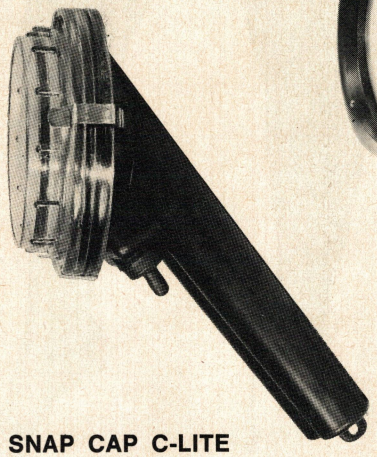


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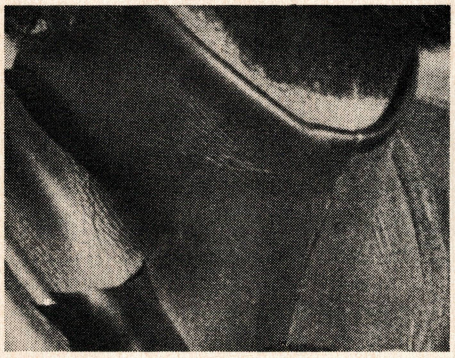
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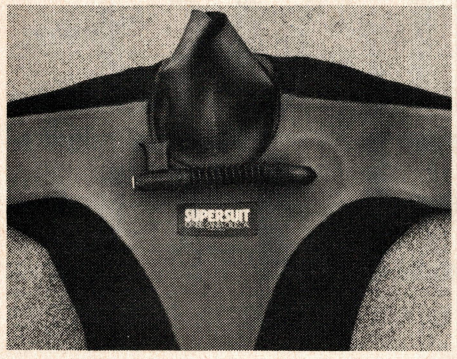
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SuperSuit

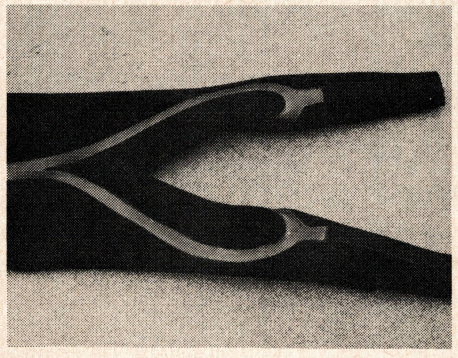
A unique inflatable suit created by O'Neill for professional and sport divers interested in freedom and comfort.



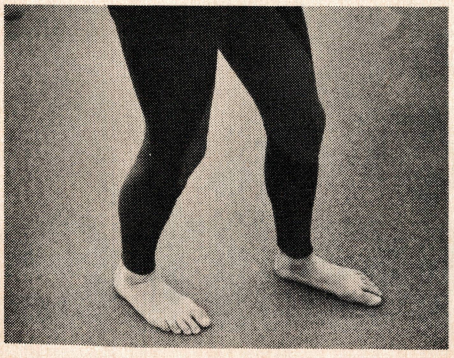
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Driftwood

(Continued from Page 7)

eyes to what appear to be remnants of wire rigging. I have seen what appears to be mast hoops, but I have a grate bar I picked up there and one of my friends found a piece of dinner plate with the legend "M.C.R.R. Co. str. M." Unfortunately the plate was broken at that point. There are many horse and mule shoes and railroad spikes.

Of course, we can only speculate, but I suspect the wreckage comes from a steamer (note to our saltwater friends; on the Lakes a ship is a "steamer" with the abbreviation str. in script) towing one or more older sailing ships with the masts cut down to stubs and called a barge. This was common practice early in this century.

The barge could have carried blacksmith supplies for the Erie Canal--the Buffalo Terminal was nearby, or since there appears to have been a "line ship" (one owned by a railroad) involved, she may have been towing barges of supplies for railroad building somewhere near a lake port.

We will probably never know the full answer, but it's like sex; what you don't see adds the most to the interest.

PAUL NEWELL PARMA, OHIO

. . . What do your readers do with older copies of SKIN DIVER? Do they rest around for months? There is a more active fate for them.

As one who has been giving used books and magazines to boys' homes in this area I wonder if you would ask your readers to find the boy's home nearest them and take SKIN DIVER to the boys. It matters not how old they are. They are ever new to boys eager for your kind of reading.

However, I have found it helpful to strengthen all magazines with a strip of either clear tape or library binding tape down the spine. This makes them last longer going through so many eager hands.

GEORGE O. MORRISON
MONROVIA, CA.

. . . In your March issue, you published a letter in the Divers Log calling for more stringent physical examinations for divers. This call being the result of concern felt for the family of a friend who had died of a heart attack while diving.

The concern felt is one which each of us feels about the loss of a friend. However, I feel that the suggestions offered and your publishing these sug-

(Continued on Page 18)



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OUR WORLD/UNDERWATER

"An Experience in Depth" is promised to all who attend Our World/Underwater in Chicago, Illinois, May 3 to 5. As the title of this fourth annual film festival-seminar-workshop program indicates, attendees will have the greatest latitude yet for experience and discovery. Headquarters for the program will be the Sheraton-Chicago Hotel and the Medinah Temple, both in downtown Chicago.

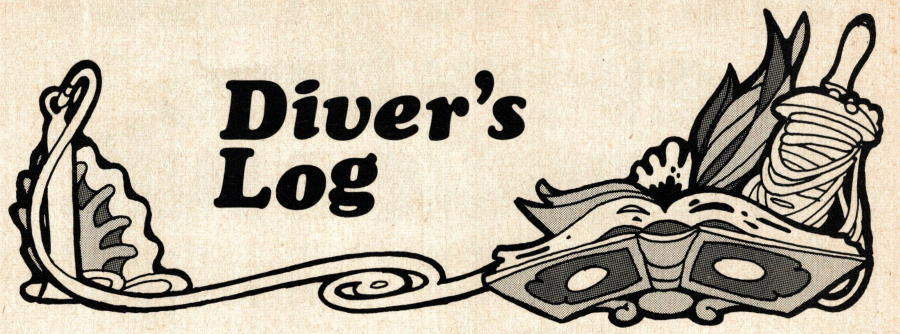
Things get rolling Friday evening, May 3, at 7 p.m., with a reception and cocktail party at the Sheraton-Chicago. Honored guests will be on hand to chat informally with ticket holders. Across the hall from the cocktail party — and open throughout the weekend — scores of booths will be open in the Exhibit Hall.

Seminars are planned all day long on Saturday, May 4, starting at 9 a.m. Topics range from wreck diving to underwater photography, with many authorities on hand to make presentations. Some of the speakers are: Al Giddings, Rick Frehsee, Dick Batchelder, Bud Brain, Sam Mareci, Nick Icorn, Tom and Zidi Mount, Hillary Hauser Anderson, Frank Scalli, Dr. Glen Egstrom, Larry Cushman, Paul Schutt, Bob Smith, Dr. Lee Somers and Paul Yarrows.

The highlight of the weekend's activities will take place at Medinah Temple, Saturday night at 8 p.m., when the gala film festival is staged. Ralph Shamlian, president of Farallon Industries, is master of ceremonies for three and a half hours of some of the most exciting film in the diving world. Scheduled are: *As Long as We're Together, 28 Above/Below, Windjammer Lost, Deadly Fathoms,* and *Beneath Cayman Waters.* During the evening, presentations of the Our World Underwater Award, and a $5,000 scholarship, will be made.

Sunday, May 5, starting at 9 a.m., a series of special how-to-do-it workshops will be held on topics such as cave diving, ice diving, spearfishing and wreck hunting. For high school and college students, there's a special Careers in Marine Sciences seminar set for Sunday morning. Sunday afternoon, from 2 to 5 p.m., demonstrations of various kinds and types of new equipment will be staged in the pool area of the Sheraton-Chicago Hotel

Special room rates for participants in Our World/Underwater are available at the Sheraton-Chicago. The complete ticket package, including a ticket for every event from Friday through Sunday, is $16. For more information, contact: Our World/Underwater, Box 643, Wheaton, Illinois 60187. (312) 286-8142.



THREE MYTHS ABOUT DIVING EQUIPMENT

BY FREDERICK A. BERGMANN

Sport diving is booming and has made some pretty fantastic changes over the past years. One of the most obvious improvements is in the quality and sophistication of the diver's equipment.

To cope with this expansion many pro dive stores have had to establish instructional sales teams, made up mostly of certified instructors, to help equip divers and to show them how to get the most out of their equipment. After several years of operating such teams, a number of interesting things are showing up about the attitudes that affect someone's approach toward gear selection and use. One misconception a team member notices is known as "Three Myths Syndrome."

The first myth is that all diving equipment is alike. This compares favorably to saying that a four cylinder economy sedan performs like a Lotus Elan because both are cars. Different models using different materials, and having a different design rationale, must behave differently. Wet suits have varying degrees of efficiency depending on cut, material, and thickness. Varying fin designs require different strokes, and some are potentially more powerful than others. Each device does its own thing its own way, having its own advantages and disadvantages.

Myth number two is the "Beginner's Rig." At one time or another every instructional sales team member has heard, "I just want something good enough for a beginner." Ask yourself this: who needs the easiest breathing regulator, the leather lunged old pro or the beginner? The same question applies to most other items of equipment. It is the beginner who usually needs the most support from his gear. While no statistical information has been assembled, many shop-school operators believe that the "beginners rig" has probably driven more people out of sport diving than any other problem. If you are diving for fun and you are not comfortable, why dive?

Another way of saying the same thing is "something good enough for now." The trouble with that approach to equipping yourself is that after buying some hobby-oriented object it is often hard to justify replacing it simply on the basis of improved performance

(Continued on Page 74)

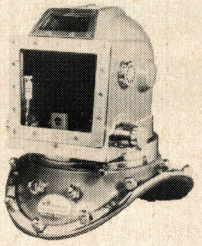
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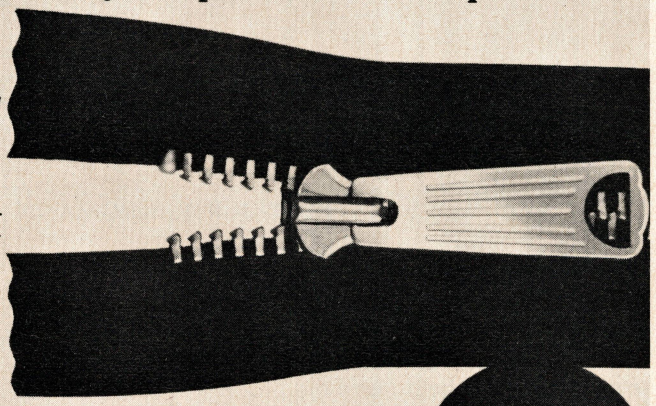
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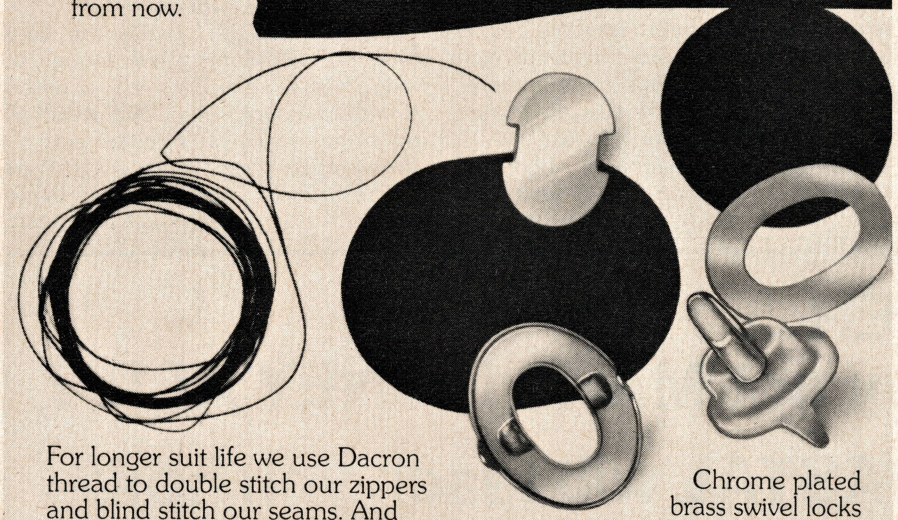
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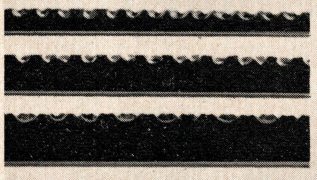


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Calendar

May 3-5
Our World/Underwater, Sheraton-Chicago Hotel and Medinah Temple. (Contact: Joyce Markstahler, 6222 N. Cicero Ave., Chicago, Illinojs 60646)

May 12
"Diving Minnesota", Polish American Club, 1003 Arcade, St. Paul, 1-9 p.m. (Contact: Scuba Explorer Post 642, 1571 18th Ave. N.W., New Brighton, Minn. 55112)

June 7-9
New York State Divers' Convention, Dunham's Bay Lodge, Lake George, N.Y. (Contact: Jeff Meuwissen, Box 22, Northville, N.Y. 12134)

June 15-16
7th Annual National Association for Cave Diving Seminar, Jacksonville, Fla. (Contact: Robert Woolf, 5018 Kerle St., Jacksonville, Fla. 32601)

June 22-29
CEDAM Annual Meeting and Symposium, Club Akumal Caribe. (Contact: Cedam International, 5820 Burning Tree, El Paso, Tex. 79912)

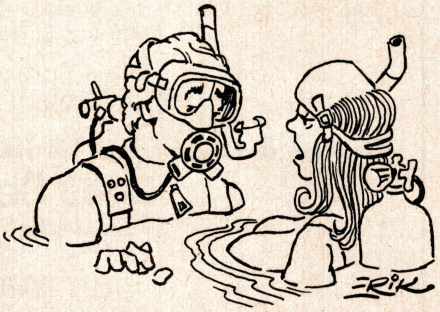
September 21
NAUI U/W Film Review, Fall Edition, John Hancock Hall, Boston, 8 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Mass. 02117)

October 4-6
NAUI 6th International Conference on Underwater Education, San Diego, Calif. (Contact: NAUI Hdqrs., 22809 Barton Rd., Colton (Grand Terrace), Calif.)

October 19
Underwater Film Review, Fall Edition, Columbia University, New York City, 8 p.m.; symposium, 11 a.m.-4 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Mass. 02117)

November 9
NAUI Underwater Symposium & Film Review, Philadelphia, Pa. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, N.J. 08023)

July 6-10, 1975
VIth Symposium on Underwater Physiology, Hotel del Coronado, San Diego. Jan. 31, 1975, deadline for receipt of contributed abstracts. (Contact: Secretariat, VIth Symposium on Underwater Physiology, 9650 Rockville Pike, Room 200, Bethesda, Md. 20014)



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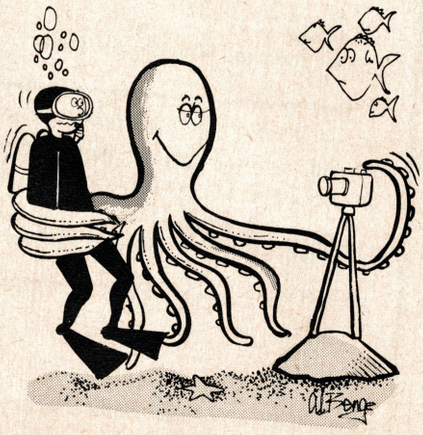
INDUSTRIAL ORIENTATION

Swimmable diving helmets. Pingers and pinger receivers. Deep diving closed circuit scuba. Underwater television. These are only a few of the many kinds of futuristic diving equipment that students of NAUI's Industrial Orientation Course (IOC) will experience during their week long training. First of the courses to be offered this year will be in the Seattle, Washington, area June 7 to June 16, 1974.

According to Course Director Leonard Greenstone, the IOC offers an excellent chance for interested and qualified divers to learn whether they want to make their living beneath the sea as the name of the game at IOC is "do it yourself." In past courses, student divers practiced underwater repairs with experts from the U.S. Navy. They learned knot tying, line splicing and the construction and use of underwater blanks and patches. There have even been chamber runs to test for nitrogen narcosis.

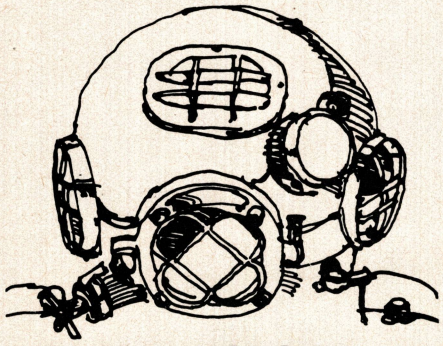
With the use of well over $100,000 worth of advanced diving gear, each student has been stimulated to use his course experience in his vocation or avocation. Use of U/W devices such as pneumatic and hydraulic tools and salvage equipment prepared the students for an actual salvage operation carried out toward the end of the course. A long list of equipment manufacturers also supplied their latest developments for the students to try.

The Seattle area course is the first of several IOC's to be held in 1974. Other courses are tentatively planned for Florida and Chicago during the summer, and the southern California area will host an Industrial Orientation Course during four weekends beginning October 19. Any certified diver may apply. Contact: NAUI Headquarters, 22809 Barton Road, Grand Terrace (Colton) California 92324.




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Driftwood

(Continued from Page 11)

gestions is somewhat shallow thinking. Would you have printed, or they have written these if their friend had died while running to catch a bus? Shoveling snow? Swimming at the local pool?

Dr. Walker was (according to the letter) aware of his condition and made a decision to participate in an activity. We can also assume that the M.D. who checked him was also aware of physical stress and its effect upon his patient's health. Dr. Walker assumed the risk, aware that he was married and had children.

The premise of the letter appears to be that if the sport does not set suitable physical standards then the government will, of necessity, step in and set standards which may be unacceptable to the majority of the diving fraternity. Perhaps.

One of the principles of regulation is that it be enforced in some way. However, a free diver doesn't have to be certified to dive. Free diving is far more "physical" than tanking. If no certification is needed to free dive, how can any regulation requiring a periodic physical be enforced? Controlling the rental or sales of wet suits is not practical as in many parts of the U.S. wet suits are not needed, such as in the midwest where the doctor died. Would these friends suggest closing beaches, pools, ponds, lakes and quarries to anyone who does not have a local permit and require a physical to obtain such a permit?

Diving is one of the few activities left to man that isn't regulated to the point that the sport is restricted to professionals. While governmental regulation is to be avoided it is also to be avoided by the sport itself when the regulations are not enforceable and would not prevent another incident.
BILL TUBBS SAN FRANCISCO, CA.

. . . I read, with much interest, your two-part coverage of the abortive salvage of the *Andrea Doria* last summer; in fact, I've always appreciated the consistent and generous coverage SKIN DIVER has always expended on visits to the wreck. I'm not a diver, nor am I a treasure hunter; in fact I can't even swim: my attraction to the *Doria* is aesthetic. I've always placed her among the most beautiful pieces of marine design ever built, right along with the White Star *Olympic* and the Inman Line's *City of Rome*.

When I looked through Gore's *Marine Salvage* and his dispiritingly pes-

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simistic remarks about the feasibility of any salvage attempt on the *Doria*, I wished that someone could take on the project and prove the man hyperwary. For awhile this summer Sat Systems, in its boldness, pragmatism and organization of technically sophisticated diving approaches, seemed to have that promise. And I regret that their hopes eventuated in such a group of disappointments.

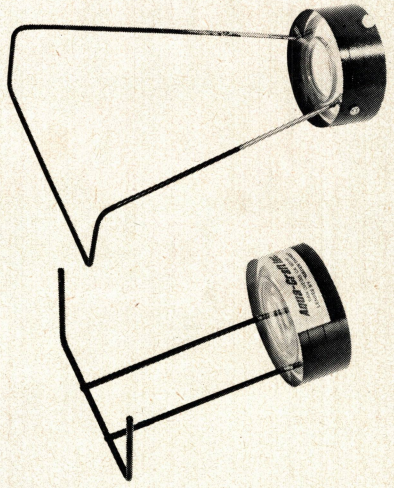
When I read in the *New York Times* that they had found the walls in the foyer collapsed, I supposed this the inevitable result of stress; namely that the weight of the ship was supported by her starboard plates, an arrangement never designed into her, with a consequent dislocation, after awhile, of the respective bulkheads, decks and overheads. As informed as I've come to be on the *Doria* since I was 16, those non-metallic, false bulkheads never occurred to me. Yet they might have to the Sat System people had they done some homework, particularly on the fittings of the *Doria's* sister, *Christoforo Columbo,* now on the Genoa-River Platte service. Perhaps they did, and even more likely, I'm wrong and gorgeously shooting my mouth off.

I wonder also about one point you raise in the second installment; namely the disappearance of the wheelhouse, and question your supposition that it had been swept away by tides rather than having been dynamited, as you originally suspected. The whereabouts of the ship's logs and other documents, not to mention the late Captain Calamai's testimony about those points, to this day remains among the more ambiguous and vulnerable parts of the Italian Line's defense of the navigation of the *Andrea Doria* on the night of the collision. I am no proponent of devil theories; nonetheless I sense an ominous parallel between the fate of that wheelhouse and the inferences that Colin Simpson in *The Lusitania* draws about the possibility of that ship's wreck having been tampered with. Does it not stand to reason that in marine architecture the wheelhouse, positioned as it is, must stand up to the most violent assaults of the sea, not to mention the racking stresses in the hull that follow on strenuous service conditions? If any segment of the wreck must succumb to the forces of the currents you mention it has to be the stack, primarily because of its exposed profile and the asymetrical balance forces that would work against its fixings; yet you state that some of its plates are buckled, others missing; but it remains intact, identifiable.

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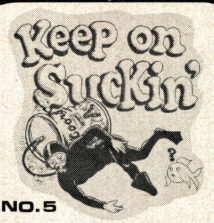
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Scuba Instructor Certification

May 3-5, 17-19, June 1-2
YMCA Scuba Instructor Certification Institute, Nashville, Tenn. (Contact: Kent Rea, 226 7th Ave. N., Nashville, Tenn. 37219)

May 3-5, 11-12, 18-19
PADI Instructor Training Course, Chicago, Ill. (Contact: Course Director, Loyola University of Chicago, 6525 N. Sheridan Rd., Chicago, Ill. 60626)

May 4-5 (1st of 6 weekends)
NAUI Instructor Certification Course, Rockport, Mass. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

May 6-11
UNEXSO Concentrated NAUI Certification Course. (Contact: UNEXSO, 1148 N.E. 48th St., Pompano Beach, Fla.)

May 17-19/June 7-9/June 28-30
YMCA Instructor Institute, Des Moines, Iowa. (Contact: Ivor L. Thomason, 101-109 Locust St., Des Moines, Iowa)

May 18-26
NAUI Instructor Certification Course, (French language) St. Jean, Quebec, Canada. (Contact: NAUI Canada, 10 Monet Ave., Etobicoke, Ont., Canada)

May 20
PADI Instructor Certification Course, Seattle, Wash. (Contact: John Manlove, Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

May 20-25
PADI Instructor Training Course, Seattle, Wash. (Contact: John Manlove, P.O. Box 70312, Seattle, Wash. 98107)

May 27-June 1
PADI Instructor Training Course, Key Largo. (Contact: Course Director, Pennekamp, Box 13-M, Key Largo, Fla. 33037)

May 31-June 3
NAUI/YMCA Crossover Certification (in French & English), St. Jean, Quebec, Canada. (Contact: NAUI Canada, 10 Monet Ave., Etobicoke, Ontario, Can.)

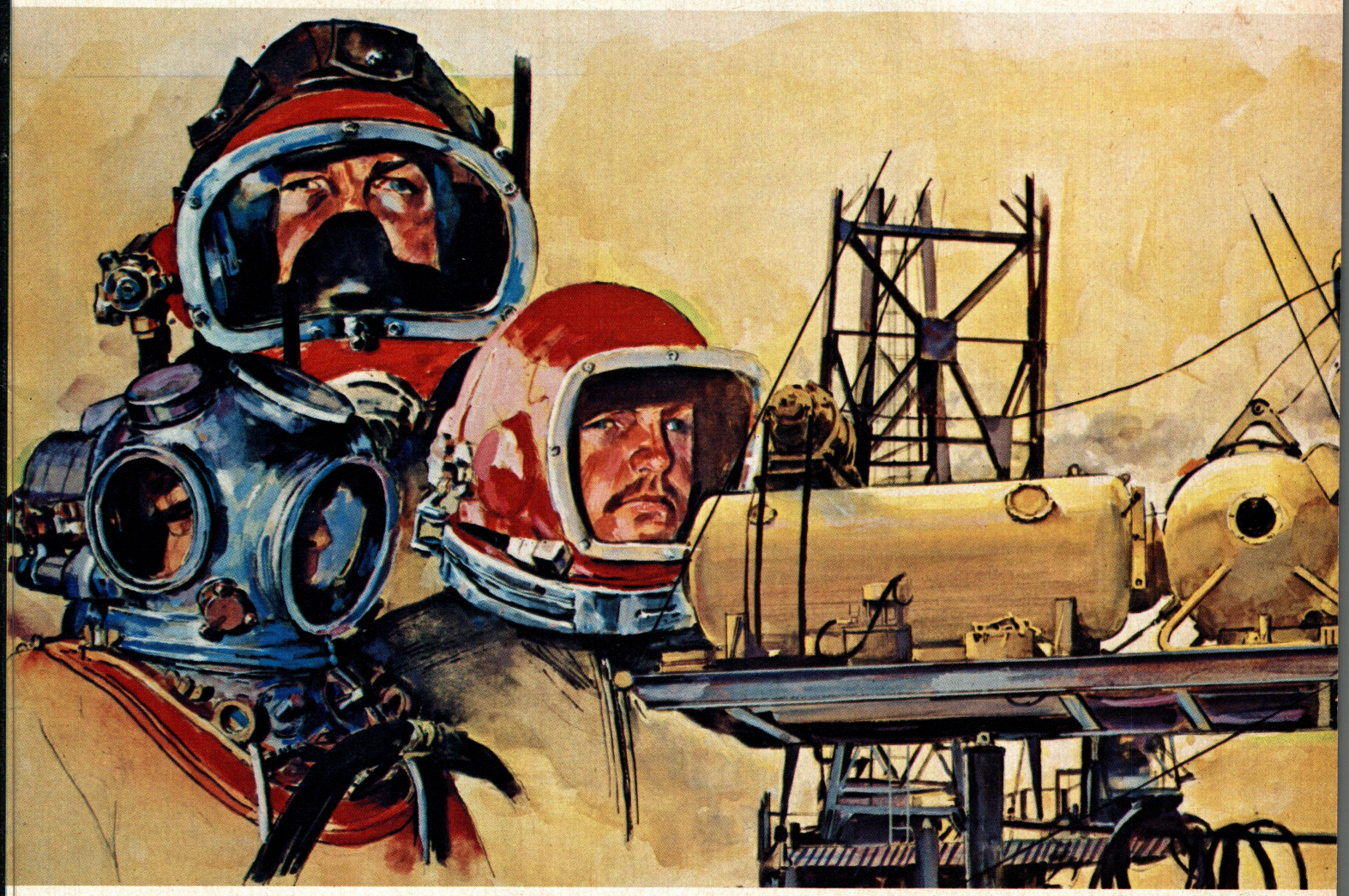
June 3-9
PADI Instructor Training Course, Miami, Fla. (Contact: Course Director, 971 SW First St., Miami, Fla. 33130)

June 14-16, 28-30
PADI Instructor Training Course, Charleston, S.C. (Contact: Course Director, P.O. Box 129, Sullivan's Island, S.C. 29482)

June 14-16, 28-30, July 5-7
YMCA Scuba Instructor Certification Institute, Trenton, N.J. (Contact: Peter Meyer, Box 611, Willingboro, N.J. 08046)

June 22-29
NAUI Instructor Qualification and Training Course, Scripps Institute, San Diego, Calif. (Contact: NAUI South-Pacific Branch, 1867 Reed, San Diego, Calif. 92109)

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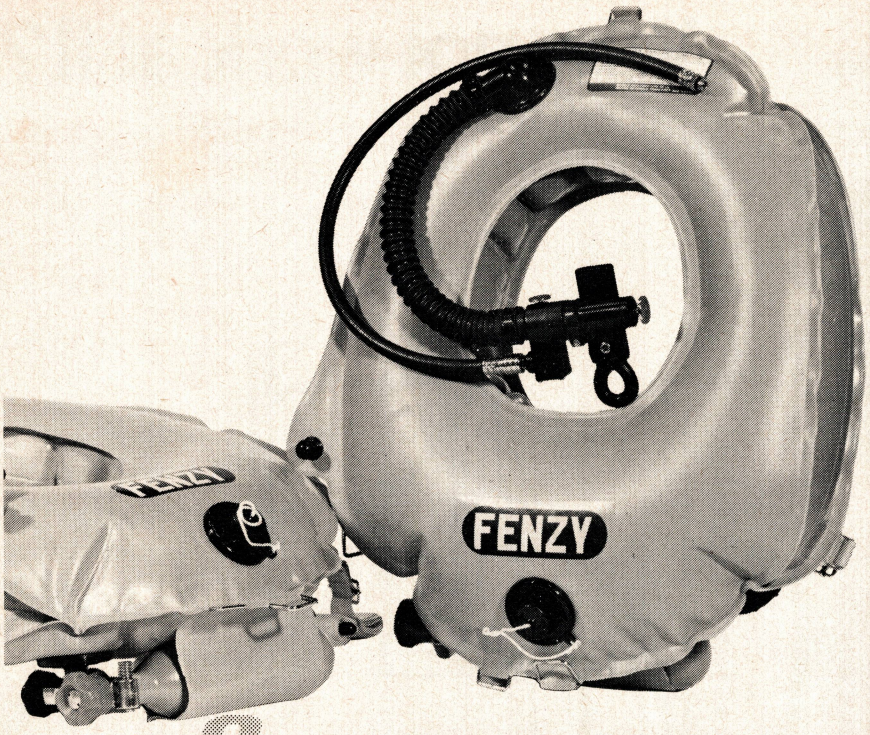
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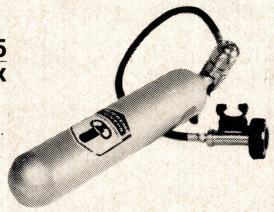
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NAUI Cross-Over Program for Certified YMCA Instructors to become NAUI Instructors, Rockport, Mass. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Mass. 02117)

June 29-30, July 19-20, August 10-11
YMCA Scuba Instructor Certification Institute, Jonesboro, Ark. (Contact: Glenn Galtere, 28056 Harrisburg Rd., Jonesboro, Ark. 72401)

June 30-July 5
PADI Instructor Training Course, Marquette, Mich. (Contact: Course Director, Division of Continuing Education, Northern Michigan University, Marquette, Mich. 49855)

July 2-September 6
NASDS College, San Diego. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

July 8
Professional Diving Instructor Course, Monterey, Calif. (Contact: Ed Brawley, 598 Foam St., Monterey, Calif. 93940)

July 19-21
NAUI/YMCA Crossover Certification, Chicago, Ill. (Contact: NAUI Mid-America Branch, Box 14156, University Station, Minneapolis, Minn. 55414)

July 22-27
PADI Instructor Training Course, Fort Worth, Tex. (Contact: Course Director 2916 Wingate, Ft. Worth, Tex. 76107)

July 27-August 4
NAUI Instructor Qualification & Training Course, Petersborough, Ont., Canada. (Contact: NAUI Canada, 10 Monet Ave., Etobicoke, Ont., Canada)

August 3-10
NAUI Instructor Qualification and Training Course, Houston, Texas. (Contact: NAUI Southwest Branch, 2120 Peckham St., Houston, Texas 77019)

August 5-10
PADI Instructor Training Course, Marshall, Minn. (Contact: Course Director, Southwest Minnesota State College, Marshall, Minn. 56258)

August 10-18
NAUI Instructor Qualification and Training Course, College Park, Md. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, N.J. 08023)

August 12-17
PADI Instructor Training Course, New Brunswick, Canada. (Contact: Course Director, P.O. Box 721, Moncton, New Brunswick, Canada)

August 17-19, September 14-16, 28-30
YMCA Scuba Instructor Certification Institute, Chattanooga, Tenn. (Contact: Bart Jones, 2831 Birchwood Way, S.W. Marietta, Ga. 30060)

August 17-24
NAUI Instructor Qualification and Training Course, Chicago, Ill. (Contact: NAUI Mid-America Branch, Box 14156, University Station, Minneapolis, Minn.)

August 24-September 1
NAUI Instructor Qualification and Training Course, Vancouver, B.C., Canada. (Contact: NAUI Canada, 10 Monet St., Etobicoke, Ont., Canada)

August 31-September 8
NAUI Instructor Qualification and Training Course, Veracruz, Mexico. (Contact: NAUI Southwest Branch, 2120 Peckham St., Houston, Texas 77019)

September 6-14
NAUI Instructor Qualification and Training Course, Monterey, Calif. (Contact: NAUI Mid-Pacific Branch, 816 Columbia St., Santa Cruz, Calif. 95060)

September 7-8, 29-30, October 11-13
YMCA Scuba Instructor Certification Institute, Passaic, N.J. (Contact: John Geary, 1007 Bellair Ave., Fairlawn, N.J.)

September 7-14
NAUI Instructor Qualification and Training Course, Palm Beach Shores, Fla. (Contact: NAUI South Atlantic Branch, P.O. Box 10356, Riviera Beach, Fla.)

September 7-8/29-30/Oct. 11-13
YMCA Instructor Institute, New Jersey. (Contact: John J. Geary, 10-07 Bellair Ave., Fairlawn, N.J. 07410)

September 21-22, October 12-13, November 2-3
YMCA Scuba Instructor Certification Institute, Dallas, Tex. (Contact: Pat Ryan, 4332 Northaven Rd., Dallas, Tex.)

September 27-28, October 18-19, November 22-23
YMCA Scuba Instructor Certification Institute, Indianapolis, Ind. (Contact: Tom Haver, 6001 Compton, Indianapolis, Ind. 46220)

September 28-29, October 19-20, November 23-24
YMCA Scuba Instructor Certification Institute, Indianapolis, Ind. (Contact: Tom Haver, 6001 Compton, Indianapolis, Ind. 46220)

September 30-October 5
PADI Instructor Training Course, Seattle, Wash. (Contact: Course Director, P.O. Box 70312, Seattle, Wash. 98107)

September 30-December 6
NASDS College, San Diego. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

October
YMCA Instructor Institute, Albany and northeast region. (Contact: Walter Hornberger, 7161 Spire Falls Rd., Gansevort, N.Y. 12831)

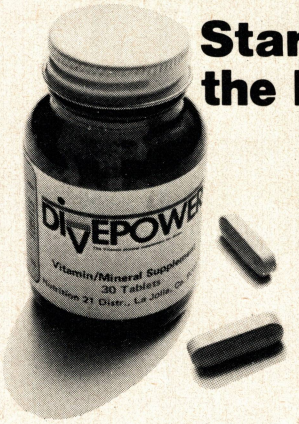
October 7
Professional Diving Instructor Course, Monterey, Calif. (Contact: Ed Brawley, 598 Foam St., Monterey, Calif. 93940)

October 30
PADI Instructor Certification Course, Seattle, Wash. (Contact: John Manlove, Divers Institute of Technology, Dept. S, P.O. Box 70312, Seattle, Wash.)

December 7-15
YMCA Instructor Institute, Cozumel, Mexico. (Contact: Jan McGinnis, 10010 Memorial #1413, Houston, Tex. 72024)

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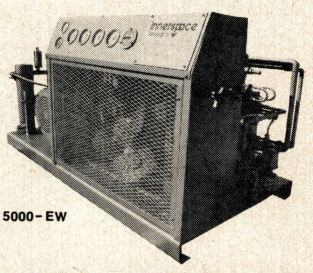
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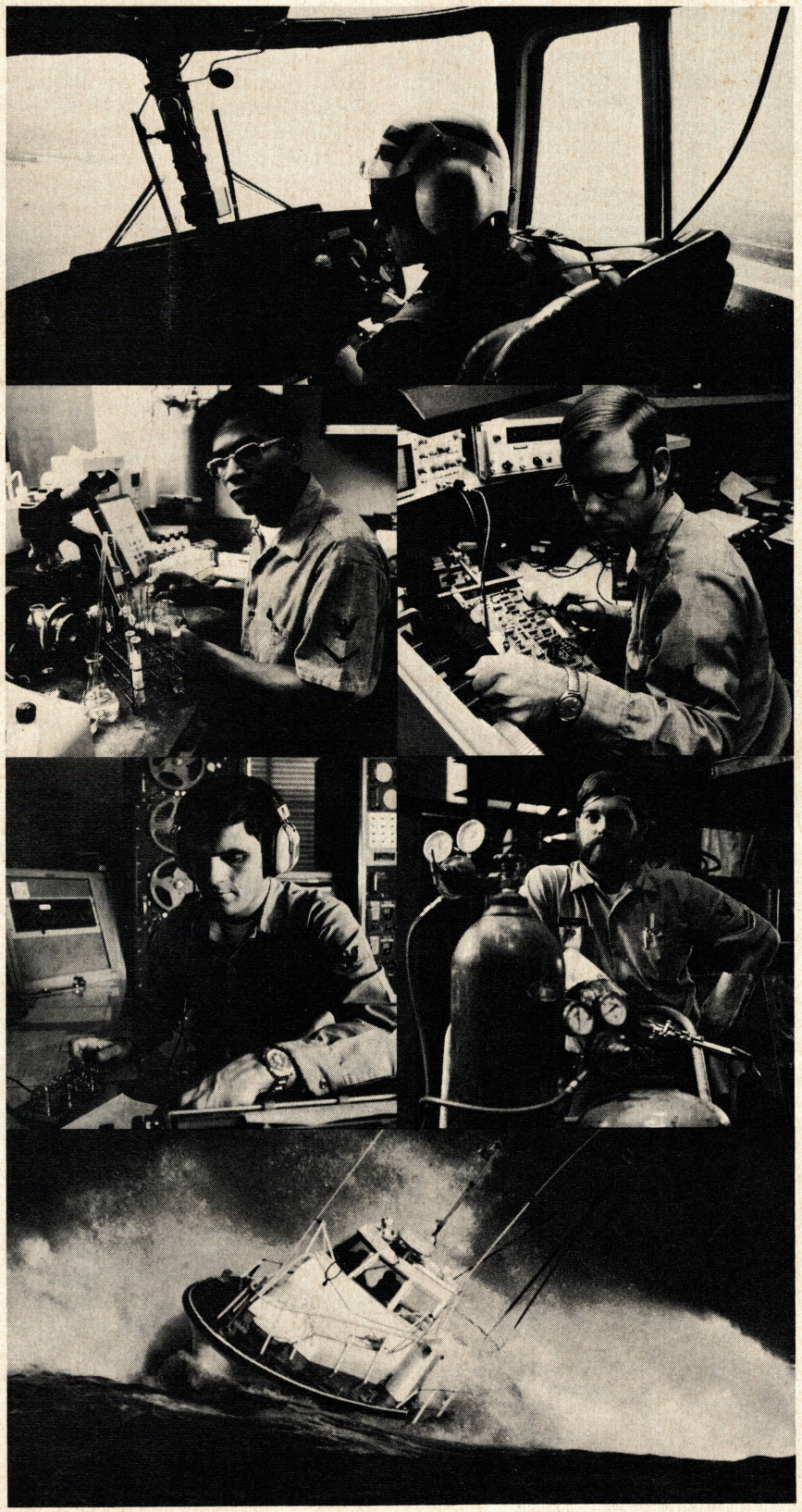
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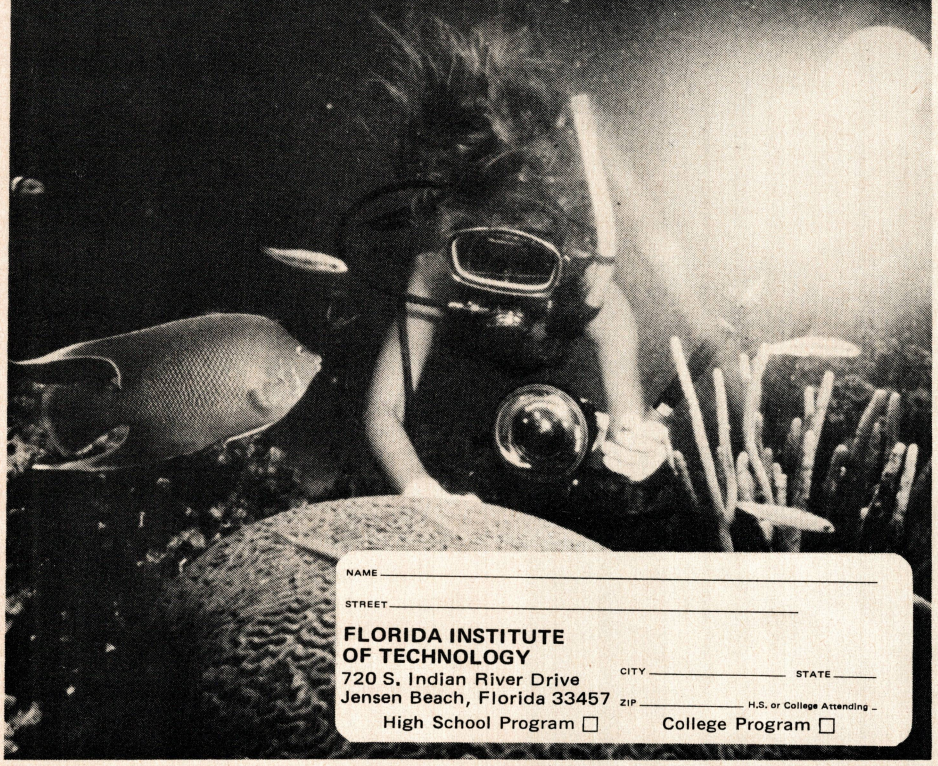
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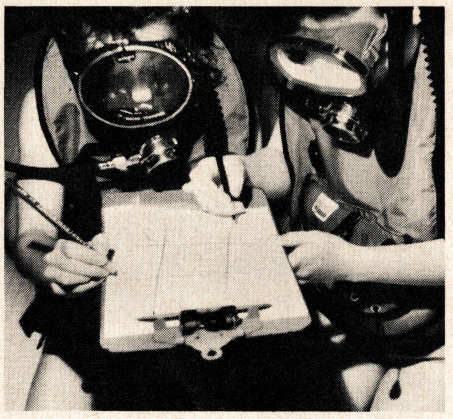
AMAZING MATERIAL

Nearly four years ago, a doctoral candidate at the University of Rhode Island set out to find a more efficient method of recording underwater data. J. C. Van Ryzin, a graduate student in the Department of Ocean Engineering, was dissatisfied with the inconvenience and loss of time involved in transcribing data from the conventional slate used in underwater operations. His search for an alternative material eventually led to NCR Appleton Paper Division, Appleton, Wis., a firm that had developed an experimental material that seemed to have some facility for underwater use.

The linkup of Van Ryzin and Appleton resulted in the commercialization of "Underwater Ascot," a material that can be written on underwater with an ordinary lead pencil, a pen or a grease pencil. Moreover, the material forms a permanent record without transcription. It can be simply dried and filed.

This unique product is a specially coated "Tyvek" spun-bonded olefin which offers multiple advantages for oceanology projects. It is impervious to moisture, dimensionally stable, rolls and folds without cracking, can be preprinted, is resistant to tearing, fraying, linting and curling, will not age, mildew or discolor, and remains flexible at cold temperatures. The coating makes it resistant to ultraviolet light, as well.

Underwater Ascot originally was used at Rhode Island in 1970, during a series of experiments designed to investigate ways to improve scuba diving visibility for the location of drowning victims and for other underwater emergencies. At Rhode Island today the material is being used in the form of three by five cards on which divers log their daily dives, and in the university's underwater habitat where the humidity is so high that water drips from the walls.



Underwater Ascot has also found a niche in underwater ecological pro-

grams like the Virgin Island Project-Environmental Research conducted at Christensted, St. Croix, in conjunction with Fairleigh Dickinson University. Christopher Cunningham, dive master for the program, reports that because of the diverse disciplinary approach to the study, Underwater Ascot was used in many ways. "Some sheets were reprinted to insure total data collecting; others were left blank to permit latitude for the user. The paper was used above the surface as well as below, and at times it was used for labeling."

Cunningham reports the material is "excellent for data collecting aboard ship and in the field. Rain and ocean spray do not affect the writing or the material. It is easy to write upon and erases well, and all team members agreed that a great deal of time was saved because we did not have to use conventional slates. In all, we found that 'Underwater Ascot' performed well in all environments."

Underwater Ascot is available in 8½ by 11 inch, 25 sheet, pads that are sealed on two sides for easy dispensing, and in 500 sheet bulk packs. Larger sizes up to 52 by 76 inches also are available. In September, 1973, the Swimaster Division, AMF Voit, of Santa Ana, Calif., became the sole distributor of Underwater Ascot.

ADP PLUS VACATION

Divers will be able to combine a diving vacation and a 40 hour NAUI advanced diving program this summer in California waters. The five day trips (the first slated for June 10-14 and July 8-12) to San Clemente and Catalina islands will include wreck diving on the *John C. Butler,* night diving off San Clemente, deep diving off Little Flower Reef, plus seminars on marine biology, equipment, techniques, diving medicine and first aid. Dr. Ken Unger will be on staff for the diving medicine lectures.

Before boarding the *Bottom Scratcher* or *Sand Dollar,* divers will have an ocean beach dive and equipment orientation the preceding Saturday, and a lecture and tour of Scripps Institution of Oceanography on Sunday. Divers must be certified as a basic scuba diver by a nationally recognized agency. The course cost is $255, which includes everything except Saturday and Sunday lodging and food. Both boats have hot, fresh water showers, comfortable bunks and a superb galley.

For more information on this combined barefoot diving adventure and informal advanced scuba diving program, contact: Glenn Kennedy, 4353 60th St., San Diego, Calif. 92115.



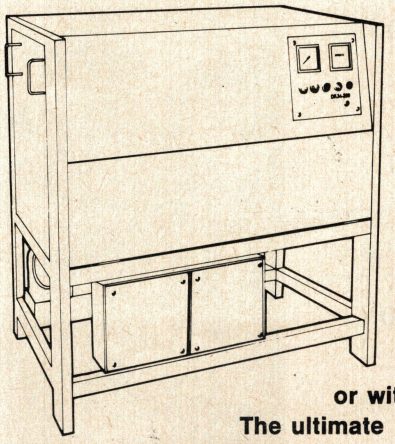
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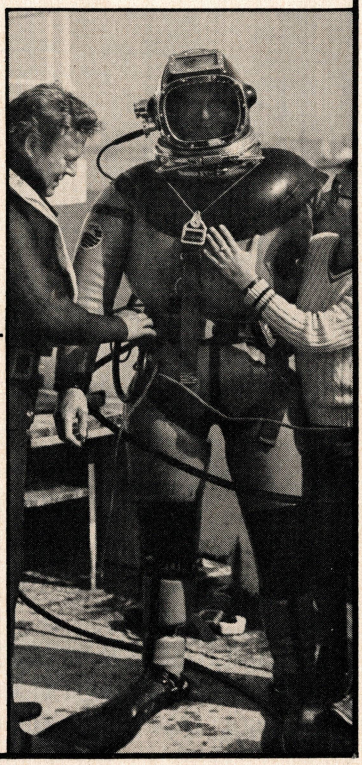
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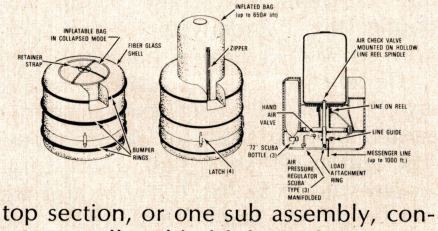
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PORTABLE SALVAGE SYSTEM

Navy divers, probing the ocean off Hawaii for retrievable salvage, are testing a prototype portable salvage system developed recently by the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, Calif. In a virtual one man salvage operation, a diver can manipulate the lift-assist device to recover objects weighing up to 650 pounds. By calling on a surface work boat, the diver can adapt the system to help in retrieving a maximum 25 ton salvage load. The same device, operated by a single man, can also move and relocate heavy objects on the ocean bottom.

Encased, the device weighs 300 pounds (dry). Its net weight adjusts from positive to negative as desired. Fully inflated, the system is five feet high and three feet in diameter. The



top section, or one sub assembly, contains a collapsible lift bag. Three scuba tanks (72's) provide a source of buoyancy gas. They are vertically arranged around the bag and mounted in a hollow cored cylindrical fiber glass housing. The upper half of the core also accommodates the bag while in a collapsed state and during storage. The lower area of the core houses a reel of messenger line.

The second sub assembly is a fiber glass structure which serves as a mounting base for the messenger line. The structure, in part, also functions as the stator of a water brake. The stator consists of short vanes mounted radially within a ring. When the messenger line reel is installed, integral vanes act as a water pump for the brake. They rotate about the reel's axle and within the stator. Close tolerances prevent free flow of water, resulting in braking action. The effective brake, plus the soft inflatable nose of the ascending bag, enable the assembly to surface without danger to nearby boats.

After the diver attaches a prod to the salvage, the bag is made buoyant by gas and released to the surface. As the lift device ascends, it unreels the messenger line which also is secured to the prod. Topside, surface personnel then lower a heavy lifting line down the messenger line to the object to be raised. The NCEL recovery device was first tested in a laboratory diving tank to depths of 10 feet and later in the open sea to 60 feet. All facets of the prototype functioned satisfactorily.

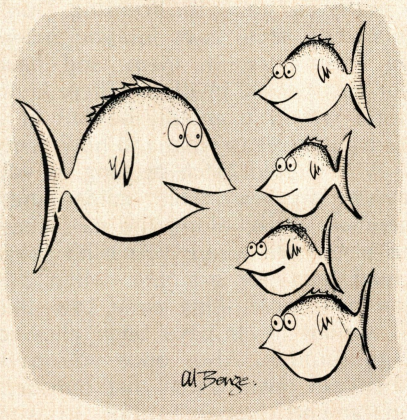
JULY 1 DEADLINE

Abstracts of papers for presentation at the Sixth International Conference on Underwater Education (IQ6) are already coming in, according to Dr. Glen Egstrom, program chairman. The National Association of Underwater Instructors is holding the giant diving conference in San Diego, California, October 4 through 6, 1974. Papers selected will be presented at the conference and at a series of seminars to allow for an exchange of information from the participants. Arrangements are being made for sessions to be recorded and made available to the public.

Dr. Egstrom said that papers are solicited in any areas related to recent diving developments, diving safety and education. He said he expects a large number of offerings on any subject related to these fields. The schedule planned for the Sixth International Conference is aimed at all divers and instructors, and includes an exciting combination of lectures, selected papers, workshop seminars, exhibits, and a film festival.

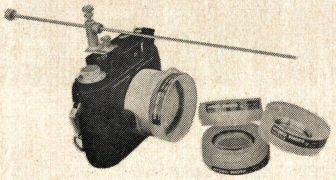
Special Problems of Diving and Instruction will again be offered this year because of its success in past conferences. The series of workshops will permit individuals to offer brief "state of the art" investigations into problem areas. These presentations need not be prepared formally, and will be scheduled at the conference.

To present a paper at IQ6, an abstract of not more than 500 words is required for submission to the Program Committee by July 1, 1974. Anyone interested in presenting a paper at the conference should first send an abstract to Dr. Glen Egstrom, Program Chairman, 3440 Centinela Avenue, Los Angeles, California 90066. Authors will be notified if their papers have been selected before August 1, 1974.

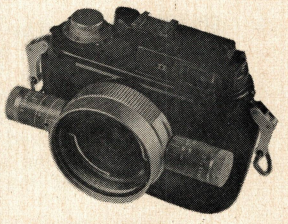


"And on the stroke of midnight, Cinderella dropped her flipper."

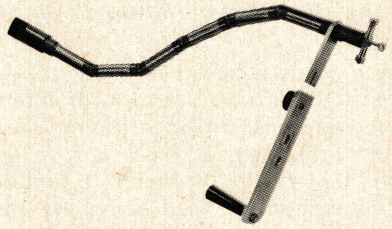
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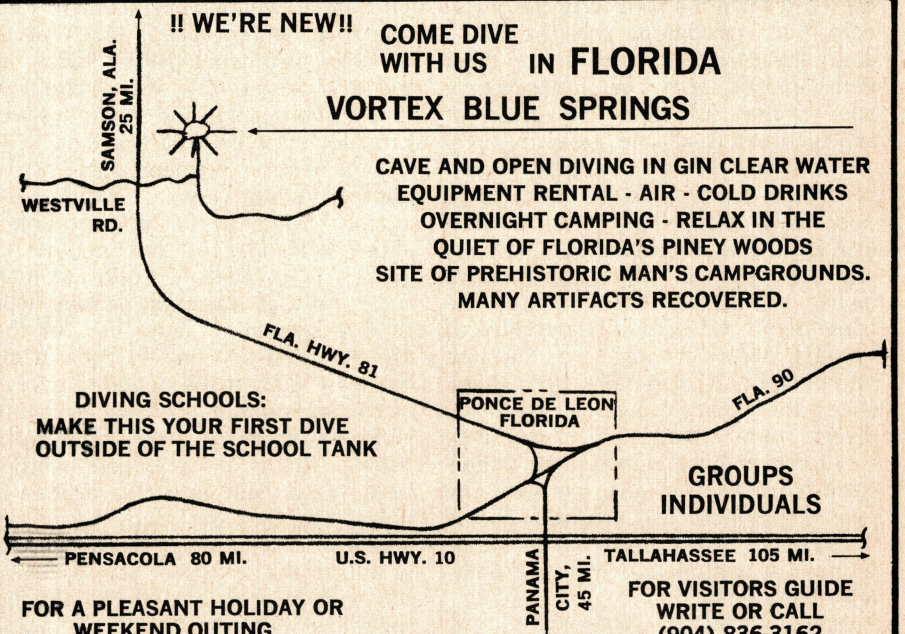


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....COMMENTS FROM

EDITOR'S NOTE: *The silent majority represents divers who have spoken up for what they believe is man's God given right to hunt for, and spear fish. The following letters are in reply to Philippe Cousteau's December, 1973, SDM article "Reconsidering the Speargun," and Paul Tzimoulis' January, 1974, editorial entitled, "Spearfishing . . . Where Do We Stand?" They are representative of divers who are purist spearfishermen, once-a-month spearfishermen, competitive spearfishermen, and even non-spearfishermen. To date, SKIN DIVER has received many letters regarding this spearfishing controversy. Unfortunately, we don't have room to print all of the letters, but the editors have chosen ones they feel, are representative. 1974 is going to be the year of the "Spearfishing Controversy." Where do you stand? We'd like to hear from you . . . .*

. . . U.S. Divers has stopped making spearfishing equipment. They have done this to curb the taking of fish by divers. This saddened, and shocked me. U.S. Divers in the past has made low cost, effective spearfishing equipment. In particular, they made the AGX spearhead. This head is the only head that is 100 percent effective on striped bass, once a good shot has been made. What does this mean? Well, it means that now spearfishermen are forced to use spearheads that are, in my opinion, only up to 50 percent effective. The result will be that more fish will swim away maimed, and will later die. The absence of high quality equipment will not curb spearfishing. Spearfishing will just be harder to do. What did divers do before manufactured guns? They made their own ineffective, dangerous weapons. Also, the lack of quality equipment will place other troubled species (abs, lobster, etc.) under greater pressure from divers.

Underwater hunting is not the same everywhere. The average visibility of Long Island waters is about 10 feet, the currents are strong and the water cold. Such conditions give the fish a great advantage, and provide the diver with fantastic sport. The diver can only take a few fish, but the pride of achievement is all the greater.

Different diving locations should specialize in things to fit their conditions. Dive shops in calm, clear tropical areas should discourage hunting, and specialize in photography, cave diving, etc. Dive shops in places like Long Island, N.Y., should specialize in hunting, wreck diving, etc., because photography is generally poor here. Divers themselves can discourage other divers from taking fish where they shouldn't or those with eggs or undersized by refusing to give the diver any peer recognition. This can be accomplished by a hearty Bronx cheer (raspberries) in conjunction with a thumbing of the nose.

JOHN FENNIMORE BROOKLYN, N.Y.

. . . I received my new copy of SKIN DIVER and I read with interest your editorial on spearfishing. The spearfishermen of New Jersey have used SKIN DIVER for years to find out about equipment used elsewhere and spearfishing trends in general throughout the world. It became apparent to us that the trend was away from common sense and sportsmanship and it started long ago.

We in the Underwater Fishermen of New Jersey, one of the oldest clubs in the country, and the oldest in New Jersey, have followed them for over 20 years. Many divers from other states have said to individual divers from N.J., "how come we never hear about you, don't you do any diving there?" The answer is that we have never publicized our fishing and never, never held aggregate weight contests. This is not because we weren't good enough to compete, or for a lack of fish, but because aggregate weight contests are wrong and we realized it in the 50's.

Another thing that we have spoken out against is spearfishing with scuba. Our rule of thumb is no scuba in water less than 50 feet deep. Much of the problem with spearfishing today, especially in tropical water, could be cleared up if scuba and spearguns were not allowed to be used together.

Spearing of resident reef fish is another subject we have advised against. Not only is it not sporting to shoot reef fish, it can deplete an area in short order. It is odd that many states restrict spearing certain types of free swimming game fish for they are the most sporting to fish for and the least likely to be depleted by us.

You mentioned licensing as a possible answer to the problems in spearfishing. This is a two edged sword at best. We in New Jersey have been involved in this for many years and whatever success we have had is mainly due to the efforts of Stanley Meltzoff, who is probably one of the first spearfishermen in the U.S., a holder of two world records, and a fine illustrator (you might have seen his pictures of tuna, tarpon, bone fish, and striped bass in Sports Illustrated over the last few years). We could see that the boating commission of New Jersey wanted to regulate us and we didn't want non-divers making all the rules for us. Stanley got himself on the boating commission and helped steer them into some meaningful legislation. If it were not for his efforts, there would probably be no scuba diving or spearfishing in the inlets and channels of New Jersey.

We had less luck with fishing licensing. Back in 1966, we realized that licensing would be necessary to avoid pressures being put on us because of some poorly worded laws on the fish and game books. The state was behind us, but each time legislation was introduced, the commercial fishing people in the fish and game council held it in committee because many commercial fishermen in New Jersey net striped bass illegally and they didn't want the state to have licensing revenue to be used to patrol for their illegal operations. Rod and reel fishermen also opposed us because the state has wanted to license saltwater fishing for years and the fishermen thought if we got licensing, they would be next.

I would like to give a little advice to any group going for licensing. Don't let anyone write laws for you unless you have a say in them, and have your best people involved. There is no reason why you should be put at a disadvantage as to what and how many fish you should catch as long as you stay within reasonable guide lines. There are states along the east coast and elsewhere where you can't spear striped bass, for example, when this is an ideal spearfishing game. Laws like this should never have been allowed to go through. Also, once you have the proper laws, watch that outsiders don't amend changes to them so as to

THE SILENT MAJORITY

make them unjust. The fox has been making rules for the chickens too long in our sport and it shouldn't be!

The conservation issue is probably the biggest one we face right now, although I can't understand why. If spearfishermen wanted to catch large amounts of game fish they would dynamite them, net them or use a rod and reel. You spoke of not taking large fish of a species. Isn't it wiser to catch one large fish than ten medium or small ones? The large one has already fulfilled its breeding responsibility and many scientists believe that egg quality is better in a prime of life fish than an old lunker. Don't forget that spearfishermen were the first underwater conservationists just as the hunters were the first land conservationists. Spearfishermen were the driving force behind the American Littoral Society, the Sierra Club of the water. I and many other spearfishermen have spent many hours at the Sandy Hook Marine Labs. I can remember cleaning fish for hours on its front lawn in preparation for its dedication dinner.

Isn't it time that scuba divers and others who put the rap on spearfishermen start putting it where it belongs, even though it might not be as easy. Pollution and loss of habitat are at fault. I think it's also time that SKIN DIVER started printing articles on spearfishing again; they have a responsibility to this part of the diving fraternity.

ART NELSON OAKHURST, N.J.



. . . For several years your editorials have consistently taken an anti-spearfishing stance, issuing statements which are either partially true or almost void of any accuracy whatsoever. Your editorial in the January, 1974, issue of SKIN DIVER is little exception to the rule. The only difference now from your previous position is that you have finally decided that it is "man's undeniable right to hunt for, and shoot fish," but competitive spearfishing is the real monster. You continue the attack by saying that, ". . . the organized spearfishing community has neglected to develop any forms of control or self-disciplines for their sport."

On the surface it would seem you lack information and understanding concerning the conduct of our meets here in California. But I know this is not the case. Through various sources you have had meet procedures and our fish and game statistics explained to you, so I know you are aware of our restrictions and limitations. The only alternative remaining is you are intentionally misrepresenting competitive spearfishing.

Perhaps, surprisingly enough, my writing you is not to take issue with your misrepresentations concerning competition, but to challenge your statement "the spearfisherman has done little to help himself or his professed sport." As a spearfisherman I have been diving in GLACD meets for going on 13 years and have been active in council activities for the same length of time. I intimately know the organizational side of sport diving, the problems we've encountered, and those we face. Also I'm aware of the beneficial results we as spearfishermen have accomplished.

Perhaps, though, you are unaware of our activities, GLACD's as well as the other councils created through your disinterest in the council structure. Whatever the reason, I want to state unequivocally that spearfishermen, competitive spearfishermen, are concerned, are helping themselves, are actively working toward the betterment of not only the sport but the resource and environment they admire and respect.

LOCKY BROWN VENTURA, CALIF.

. . . The Underwater Society of America is responsible to the diver's needs and wants, whatever they be, for this is the reason that he has formed this organization. . . . From the beginning of the society, spearfishermen have been a small but highly vocal group in the society. . . . This competitive skin diver is a highly trained, skillful hunter and marksman. In competition his catch is donated to hospitals, charitable organizations, orphanages, or fish fries.

In this regard, we might ask how does the society enter into the subject of spearfishing in general that is now raging within and outside this country. As Administrative Director of Programs for the society, I say we stand responsible to work out a program of education and enlightenment in regards to spearfishing. I have written to Bob O'Donnel, Director of Skin Diving, and Bill Barada, Director of Environment, for the society to work out such a plan. The essence of such a plan shall be:

1) An educational program — the contents of which will be:
   a) Spearfisherman's responsibilities
   b) Do's and Don'ts of spearfishing
   c) What species and sizes — salt and freshwater — that can be hunted
   d) How a "Sportsman Spearfishman" can protect the sport from irresponsible "killers" and novices
2) A cooperative program — how to work with:
   a) State and national conservation agencies
   b) Wildlife Federation, Isaac Walton League, etc.
   c) Commercial Fisherman and Fisheries Department
3) A position paper on the U.S. position of Skin Diving — Spearfishing to be presented to the International Spearfishing Meet in 1974.

We feel that now is the time to take a firm hold on this part of our sport and direct and channel it into the area of respect that a true sportsman within it wishes it to be. Now is also the time, due to the increase in members, to set up rules to follow for anyone who enters the water with mask, fins, snorkel and a "gun."

H. R. SHANKS
U/W SOCIETY OF AMERICA

(Continued on Next Page)

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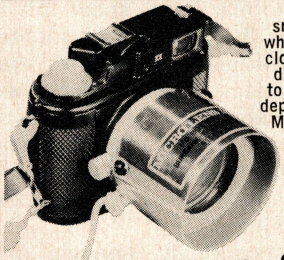
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SILENT MAJORITY

(Continued from Preceding Page)

. . . Philippe Cousteau and a few other renowned divers have recently boarded the ecology bandwagon by attacking spearfishing. Their motives are noble, but sometimes there are those who only serenade the politicians and the press in order to enhance their own glittering images. We spearfishermen are just as concerned about preserving marine life as any other diver group! After all, we won't have any fish to spear if the food chain is adversely altered. Eliminating spearfishing in order to preserve marine life, however, is like prohibiting motor scooters in order to conserve fuel.

There are two burning questions about spearfishing which scream for a truthful answer. First, why is it considered barbarian for a few spearfishermen to take a few fish during daylight hours on weekends, but considered sporting and acceptable for thousands of line fishermen and commercial fishermen to take tons of fish every day and night of the week? Secondly, if spearfishing is so efficient (they say it threatens depletion of marine life!), why haven't commercial fishermen converted to spears instead of those "old-fashioned" nets, lines, electric reels, seines, etc? I hereby challenge anybody to deliver an answer to either one of these questions that will indicate spearfishing should be eliminated.

Statistical analyses have shown that spearfishing takes about one half of one percent of all fish taken along coastal reefs (Ref.: California Department of Fish and Game, Fish Bulletin 130, dated 1965.) Spears probably take less than one millionth of all fish taken throughout the world on the open seas by nets, trawlers, traps, etc. Cousteau says that spearfishing might be just that little amount that will push us over the precipice into complete depletion of marine life. I propose that we scientifically limit taking of all species by all methods.

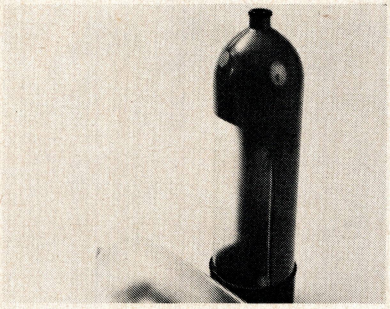
I believe we should provide money, by requiring fishing licenses, to fund accurate, meaningful studies of marine food chains by qualified marine biologists and establish limits, if necessary, to restrict size and/or bag limits on critical species. But we must protect all marine life (shells, tropical fish, bait fish, edibles, non-edibles, turtles, porpoises, seals, etc.) taken by anyone: angler, commercial, charter boat, spearfishermen, et al.

(Continued on Page 38)

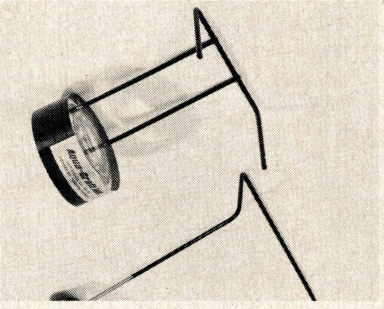

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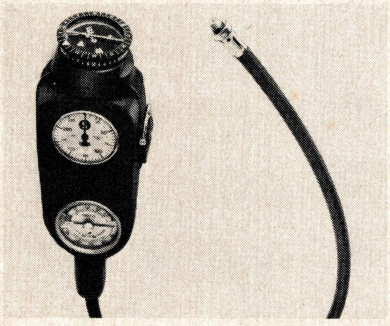
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Instead of modifying your camera with an extension tube, catch targets as they occur with the Green Things lens system, which is interchangeable underwater! Simply slip on your macro lens with attached framer, shoot the picture, and move on to the next subject. Macro Lens IV (1:4) covers 4" x 6" and is $34.50; Macro Lens III (1:2.75) covers 3-5/8 x 2-1/2 in., is $39.50. Contact: Aqua-Craft, 3280 Kurtz St., San Diego, Ca.



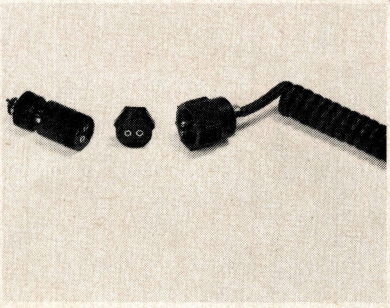
Scubapro's new instrument console consolidates all necessary underwater instruments in one location. The all rubber console slips on Scubapro's #132 submersible gauge or #136 dive timer, and accommodates the automatic decompression computer, Scubapro depth gauge(s) and the LS-1 compass for instantaneous reference, safer diving. Retail price is $13. Contact: Scubapro, 3105 E. Harcourt St., Compton, Calif. 90221.





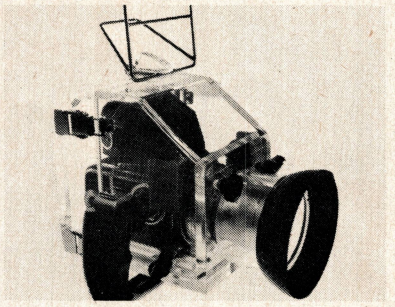
Two new back packs from U.S. Divers are made with durable Lexan frames and accept both 6.9 and 7.25 inch diameter cylinders. The Aqua Pac, which retails for $21.95, has new stainless steel non-slip covered bands. Simple wingnut adjustment makes tank placement easier. The Kam E-Z Pac, for $29.95, has a new quick-release Kam mechanism for easy tank removal. Contact: U.S. Divers, 3323 W. Warner Ave., Santa Ana, Ca.

Ikelite has a new pluggable strobe connector system which is safe, dependable and simple. All components afford complete waterproof integrity and may be disconnected above or below water. The plug mates with either the housing bulkhead unit or the special Nikonos adapter. Individually the plug is $9.95, the receptacle is $9.95 and the Nikonos adapter is $19.95. Contact: Ikelite, 3303 N. Illinois St., Indianapolis, Indiana.



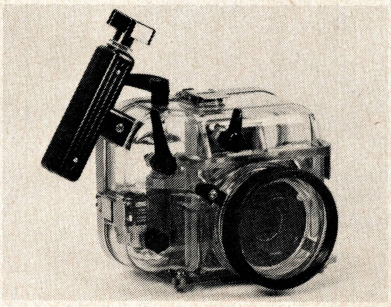
Fredric L. Diamond Co. is selling a new hand light which is submersible to 200 feet. This 40,000 candle power pinpoint beam gun illuminates targets up to one quarter mile away with only a standard six volt lantern battery. Pistol grip propylene case with magnetic switch is sparkproof, so safe around combustibles, and it floats beam up. $22.75. Contact: Fredric L. Diamond Co., 12445 Woodley, Granada Hills, Ca. 91344.





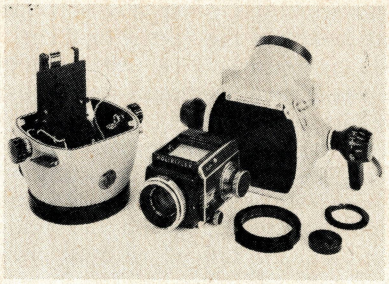
Sea Research & Development, Inc., has come out with a new housing for Hasselblad cameras called the SeaCase Hasselblad. All controls are easy to operate, and it features underwater connector for flash/strobe. The housing was designed specifically for the Hasselblad's meter finder, and has a depth capability to 200 feet. Priced $550 to $695. Contact: Sea Research & Development, Inc., Box 589, Bartow, Fla. 33830.

Ikelite has redesigned the back cover for their SLR cases to give them a depth capability of safe operation to 300 feet. Actual failure is below 500 feet. Reinforcing and a redesign of the back cover seal make this possible. The back cover #5515 is available separately, for $29.95, to make earlier model SLR cases safer. The back is standard on all new cases. Contact: Ikelite, 3303 North Illinois St., Indianapolis, Ind. 46208.



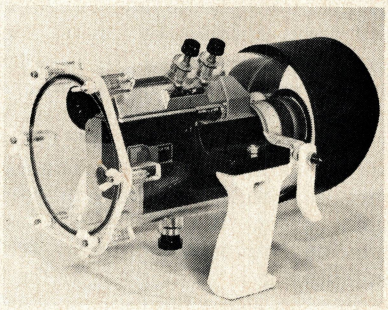
The Opal-Eye is an ultra wide lens by Green Things, designed specifically for use with the Nikonos camera. The lens accessory increases the 35mm lens' 49 degree angle of coverage to 105 degrees (diagonal) so that divers, for instance, can be photographed in full from less than three feet away, with a phenomenal depth of field. The retail price is $149.50. Contact: Aqua-Craft, Inc., 3280 Kurtz St., San Diego, California.



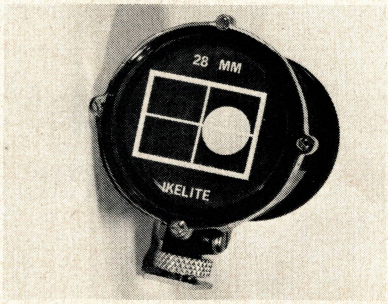


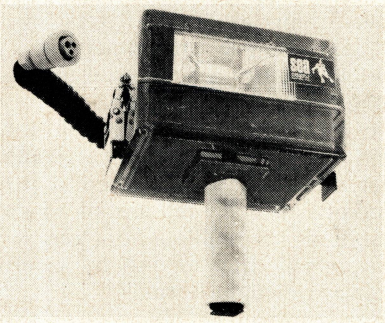
Wulf Koehler Inc., of Darmstadt, West Germany, is manufacturing a full-control housing for the Rolleiflex SL 66. It features adaptability for a wide range of lenses, two flash sockets, and a 45 degree optical prism view finder. Magazines can be changed without removing the camera from the housing. Dome port is available. Priced around $1,400 (U.S. currency). Contact: Wulf Koehler, 61 Darmstadt, Karlsbader Str. 11, West Germany.

Canon 814 owners! Here's a new underwater housing for the Canon 814 that features zoom, gear-driven lens and shutter controls. The unit is constructed of clear cast acrylic tube, is o-ring sealed, and guaranteed to 300 feet. The apparent weight of the unit in salt water is approximately 14 ounces, resulting in a very maneuverable unit. Priced at $79. Contact: Ryan Products, P.O. Box 6506, Columbus, Ga. 31907.



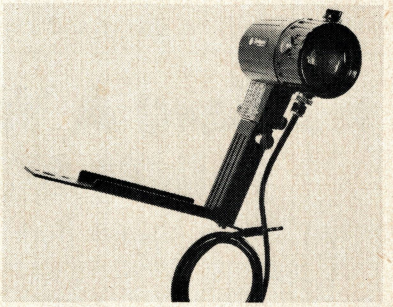
The new Ikelite Optical Viewfinder provides fast and accurate aiming for most camera and lens combinations. The finder utilizes a series of lenses to function like a 15mm camera lens, making it capable of seeing more than the eye can comfortably see. Masks for 28, 35, 50, and square 126/movie format lenses indicate the picture area taken by the camera. $29.95. Contact: Ikelite, 3303 N. Illinois St., Indianapolis, Ind.



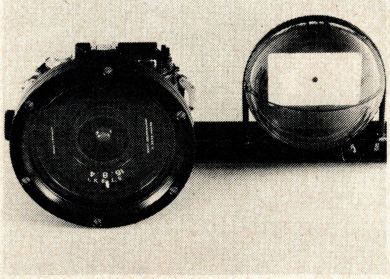


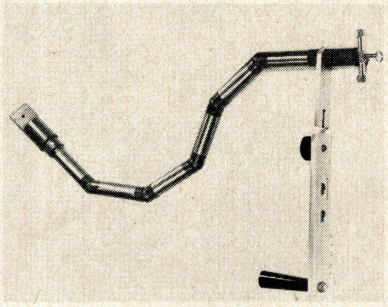
The SeaStrobe 101 is the single strobe version of the SeaStrobe 120 from Sea Research and Development, Inc. SeaStrobe 101 has a 70 degree angle beam, 5800 degree color temp., and recycles in four seconds. It comes with a pistol grip and accessory shoe, weighs 66 ounces topside or one ounce underwater. Complete with three foot coil cord. $145. Contact: Sea Research & Development, Box 589, Bartow, Florida.

Subsea Products has announced the all new Mark 25, a high intensity, yet extremely compact mini-strobe. The Mark 25 yields a light intensity equal to many larger strobes, yet is powered by just two C-size alkaline batteries for over 350 flashes. Supplied with handle, standard Nikonos bracket and the E.O. connector, the Mark 25 retails for $169.95. Contact: Subsea Incorporated, P.O. Box 9532, San Diego, California 92109.



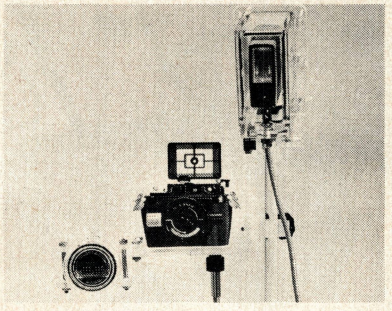
Seven Seas Optics in Brussels has developed a fantastic 98 degree lens for the Nikonos II. The price for the lens (in U.S. currency) is $475 with diaphragm and focusing controls. The 98 degree Standard (fixed focus, diaphragm control) is $420; the 98 degree Compact (fixed focus, diaphragm f4 only) is $370. The optical viewfinder for the lens is $36. Contact: Seven Seas Optics, Rue Richard Kips 3, 1040 Brussels, Belgium.





Hydro Photo's Cobra flash arm consists of five ball socket joints. Each joint is capable of bending 35 degrees or rotating, making the unit extremely versatile. Overall length of the arm is 27 inches; corrosion resistant materials used throughout. The Cobra Arm, which sells for $70, was designed to be compatible with existing U/W photography systems. Contact: Hydro Photo, 3909 13th Ave., South, Seattle, Wash. 98108.

A new strobe housing from Ryan Products makes possible the use of almost any rectangular strobe with the Nikonos camera. The unit comes complete with the strobe housing, arm, camera platform, Nikonos "x" sync strobe connector, and bracket for the Sekonic L-86 light meter for $76. The swivel bracket is fully articulated for unlimited positioning of the strobe. Contact: Ryan Products, Box 6505, Columbus, Georgia 31907.



SILENT MAJORITY

(Continued from Page 34)

Spearfishermen strive for larger fish, which among groupers are males. (Ref.: Sea Frontiers, Dec. 1966, Feb. 1963, July 1964.) Electric reels and hooks do not discriminate on size or sex, but take all sizes and species in large quantities. Some line fishermen justify their position by saying they release smaller fish. It is doubtful whether these fish survive if brought up rapidly from water more than 50 feet deep because their air bladder usually ruptures. Most experienced tropical fish collectors know that fish actually suffer "bends" unless given proper decompression during ascent.

Spearfishing is a sport . . . this is true, but it is also a hunt for food. We do not shoot fish solely for the love of killing, but to put meat on the table. Most of us only take enough fish for our family and friends, but we will gladly limit ourselves if it is proven that we are threatening the very existence of the species we hunt. But are you sure that it is we spearfishermen who are threatening any species? Again let us refer to that California Bulletin 130 where spearfishermen took 16 pounds from a total of 40,820 pounds of sharks and rays. Who took the other 40,804 pounds and what did they do with them?

I vigorously agree with Philippe Cousteau that we must stop abusing the ocean, but it's upsetting to read about how and whom he wants to stop. The answer to conservation of marine life is not through discrimination against any group or minority of fishermen. Rather, we must protect all marine life taken by any means.

ROBERT F. REILAND
LAKE PARK, FLORIDA

. . . Regarding the recent statements by Capt. Costeau to discontinue spearfishing, I cannot agree. I am in agreement with your editorial that there are all kinds of spearfishermen and that the FEW bad ones have given us all a bad name. But I see nothing wrong with shooting a fish for dinner.

I hope all those who are against spearfishing are pure vegetarians for if you believe in something, you should live up to it. It is not the spearfisherman who has decimated our fish life for his annual catch is less than one millionth of the annual commercial catch of fish. Commercial fishing interests deal in millions of tons and hundreds of millions of tons while the annual catch of fish by spearfishmen is ridiculously small.

There are perhaps a hundred thousand or more sports fishermen to every skin diver and we all know a rod and reel fisherman can catch far more fish on a day by day basis than the skin diver. They fish the same reefs and I have seen many boats catch a hundred or more snappers and groupers in a single day. This would deplete the fish life much more than the spearfisherman. It's a fact of life that most spearfishermen shoot VERY LITTLE, for it is only the skilled spearfisherman who can make a good haul.

I don't think spearfishing should be discouraged if the fish are to be eaten. Whether the fish is caught by rod and reel, by commercial fish net or by the spearfisherman, it is still dead so what's the difference? I have spent a lifetime on the reefs and know that fish populations vary from year to year. Pollution is the worst offender for it kills everything but in the lower Keys in Florida, the fish seem to be as numerous as ever despite 20 years of spearfishing. I would say that on remote islands where the reef is limited, a curtailment of spearfishing for a year or two might be advisable, if conditions warrant it and if the scarcity of fish was caused by excessive spearfishing.

ROBERT P. L. STRAUGHAN
BELLEVIEW, FLORIDA





Our compact 50 hp looper keeps the whole gang happy from dawn 'til dusk. But doesn't take a whole lot of gas to do it.

Loop charging is one reason. It's a Johnson design that precisely positions intake and exhaust ports to bring in the new fuel mixture while pushing out the exhaust in one continuous power loop. Makes gas work harder. Last longer.

So does our exhaust tuning. It uses the energy from sound waves to pull more exhaust gases out of each cylinder and to pack in more of the new fuel charge. Giving you more power without using more gas.

And there's more to boost power and save fuel. Pressure-back piston rings that reduce friction. Magflash™ ignition which keeps the running smooth through the speed spectrum. Thermostatic and pressure controlled cooling. For best idling, for best cruising, too.

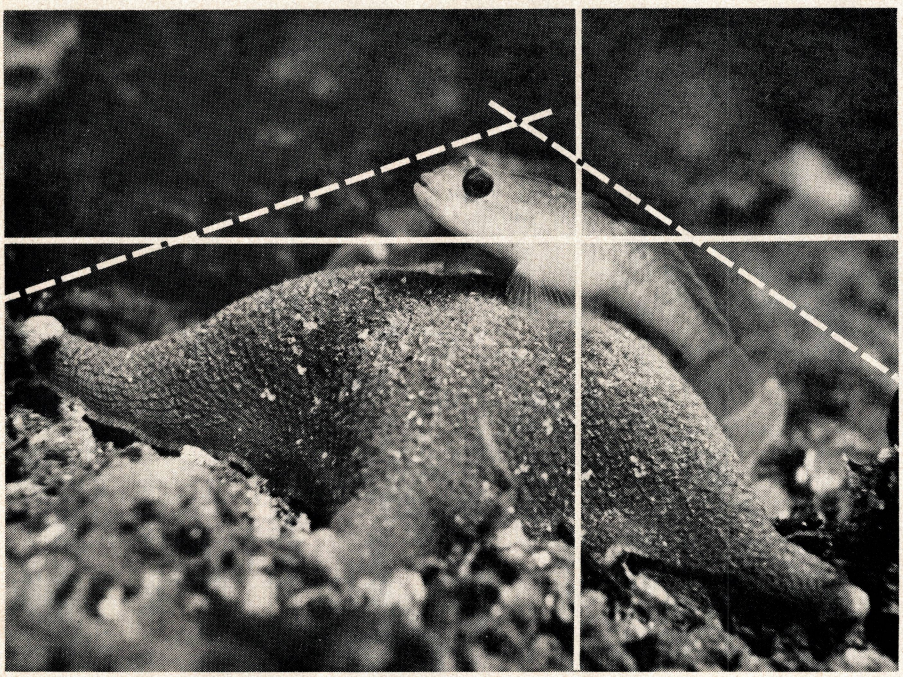
It all adds up to more on-the-water time anyway you want it. See our 50 hp and our 70 hp looper at your Johnson dealer. See our other power choices—2 to 135 hp, plus new electric auxiliary motor. Or write for catalog. Johnson Outboards, Div. Outboard Marine Corp., Sea-Horse Dr., Waukegan, Ill. 60085, Dept. SD-54.

Under Outboard Motors

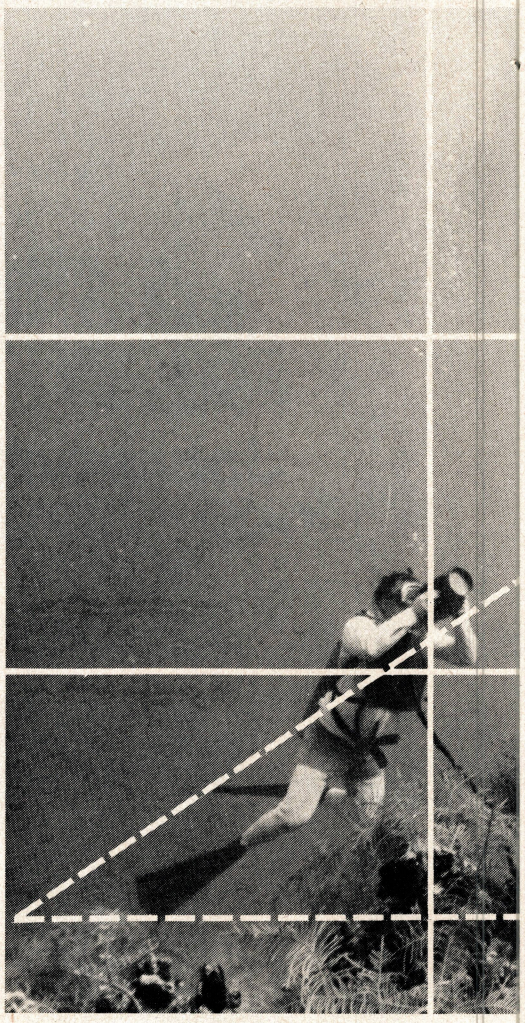
First in Dependability

Johnson OUTBOARDS

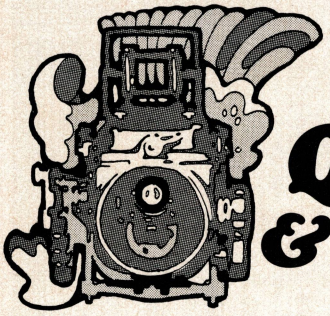
BASIC RULES OF PHOTO



photographs by Authors



The picture of the small fish resting on a starfish illustrates pyramid construction and rule of thirds.



UNDERWATER PHOTOGRAPHY

Quick & Easy

PART XLI



By Jim and Cathy Church

Underwater photo composition is the art of arranging the elements within an undersea scene into an eye-appealing picture. While much about composition can be learned by attending film festivals, and by reading magazines, we believe that a beginner will learn more efficiently if he begins with the basic rules presented in this article.

Point of Interest — Most pleasing pictures have a single point of interest which attracts the viewer's eye, or multiple points of interest which lead the eye from one point to another. We say "point(s) of interest" rather than "center(s) of interest" to emphasize that the point of interest is not always best located at the center of the picture. In the illustration showing a diver filming a movie sequence of another diver posing in a sponge, the viewer's eye is led from the first point of interest (the U/W photographer) to the second point of interest (his subject).

Rule of Thirds — Both divers in this illustration are located in accordance with the rule of thirds, a method of locating points of interest in a picture. When the picture area is mentally divided into thirds, horizontally and vertically, the imaginary dividing lines intersect at four places. Composition can often be strengthened by locating the point(s) of interest near these intersections. Notice how the U/W photographer is near the intersection at lower left, and his subject is near the intersection at upper right.

Balance — There should be balance between the objects shown in a picture. Objects of like size and shape, such as the two divers in the illustration, can be balanced by placing them at approximately equal distances from the center of the picture. They are aligned on an imaginary line (called a leading line) passing diagonally through the center. With objects of different size, smaller objects can be placed further from center to maintain balance.

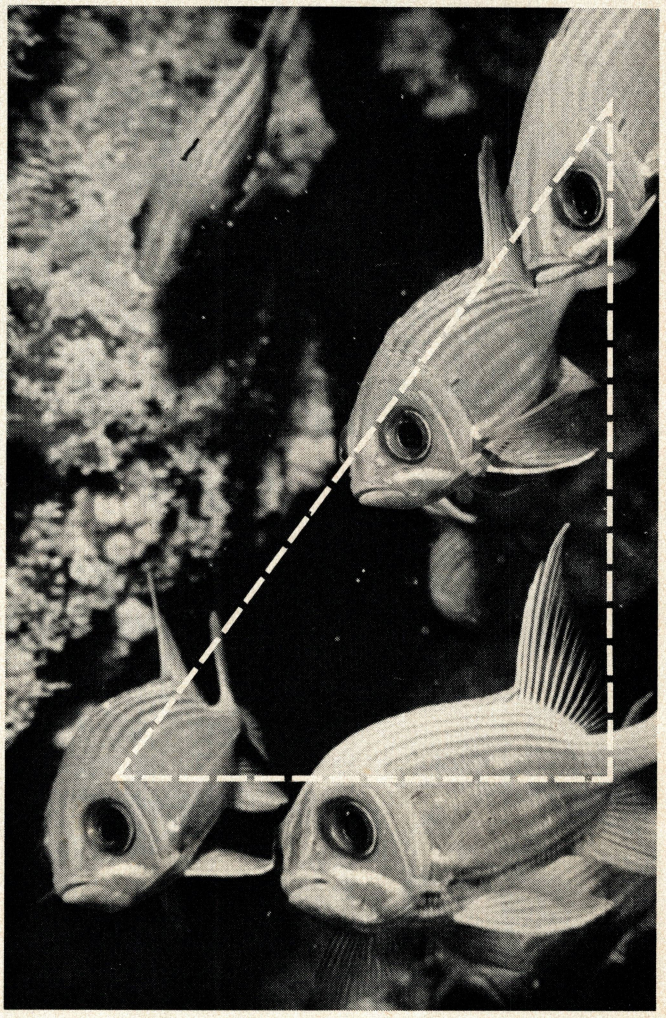
Triangles — Objects in groups of three, and sometimes

GRAPHIC COMPOSITION



The photograph of the U/W photographer filming a diver in a sponge illustrates the rule of thirds, multiple points of interest, balance of like objects, triangular construction, subject-predicate, and left to right eye travel.

photograph by Jack McKenney



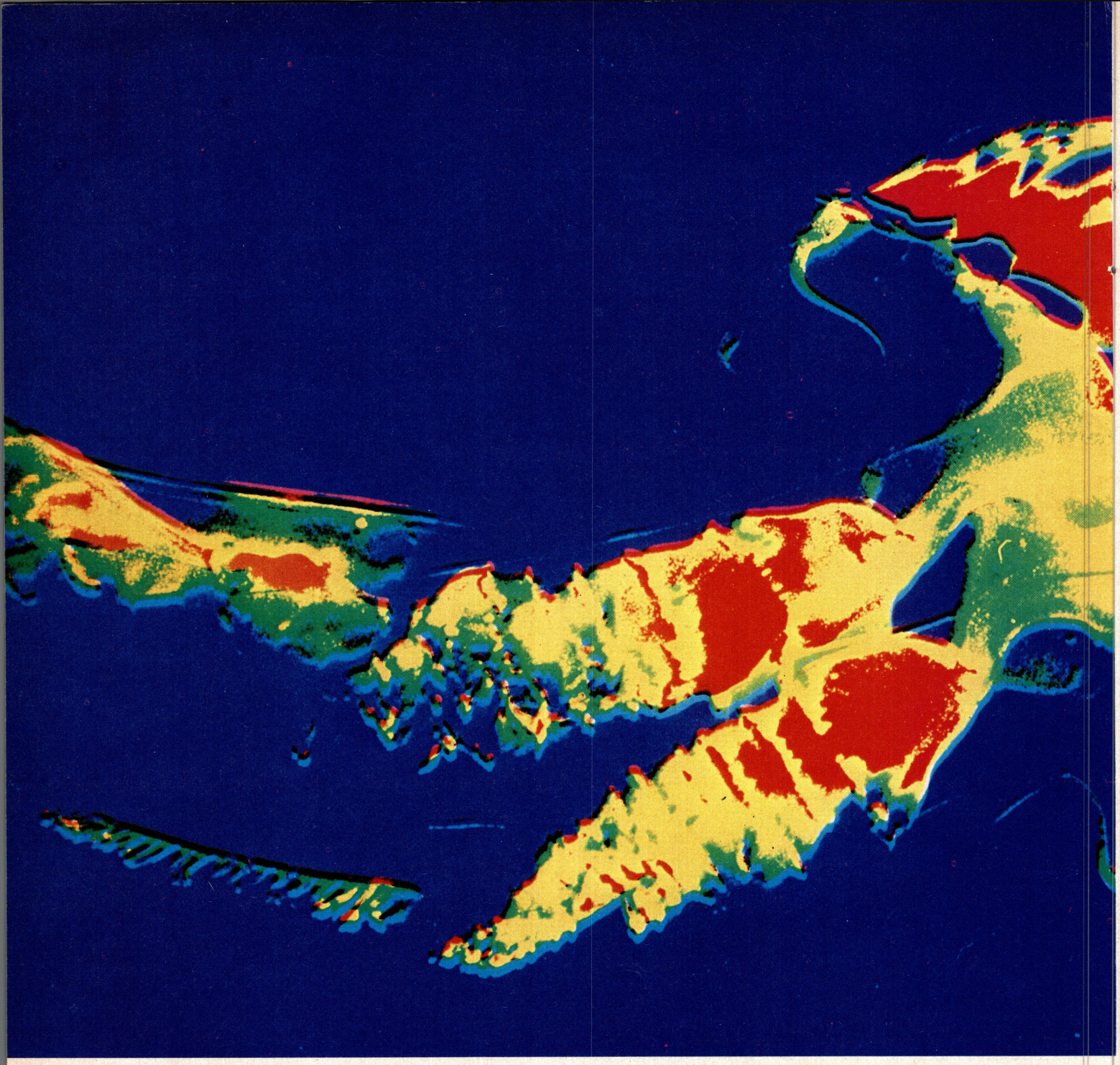
This photo illustrates strong triangular construction.

more, can be photographed in a triangular arrangement. This is especially effective if one or more of the angles forming the triangle can be located near an intersection of thirds. In our example, the triangular construction is readily apparent — the horizontal base runs along the lower border of the picture, the angled line runs up from the photographer to his subject, and the vertical line to the right of the sponge completes the triangle. Other forms of this construction — simple angles or pyramids — are also used to balance objects in a picture.

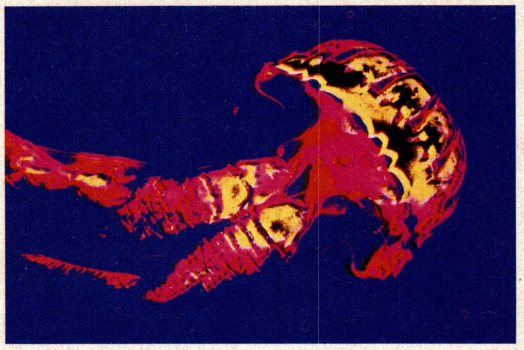
Subject-Predicate — We can think of some pictures as "sentences" which express a complete thought. Our illustration, like a sentence, has a subject (the U/W photographer) and a predicate (what he is doing). To show the importance of this rule, cover half of the illustration so only the photographer, or his model, can be seen. The impact of this picture is reduced when the action is incomplete.

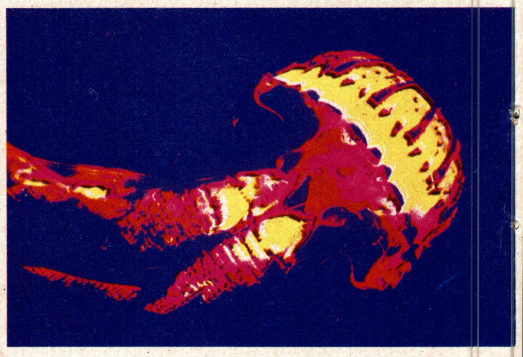
Left-to-Right Eye Travel — Pictures showing strong action are often best composed when the action flows from left to right — the direction your eyes travel when reading. Hold our example up to a mirror to reverse the action — notice how much impact is lost. However, many excellent pictures portray action flowing from right to left. But when this is the case, the leading lines (imaginary lines formed by the background or objects in the picture) usually lead the eye from left to right. This is especially effective when the eye is lead from the lower left intersection of thirds to a main point of interest to the upper right.

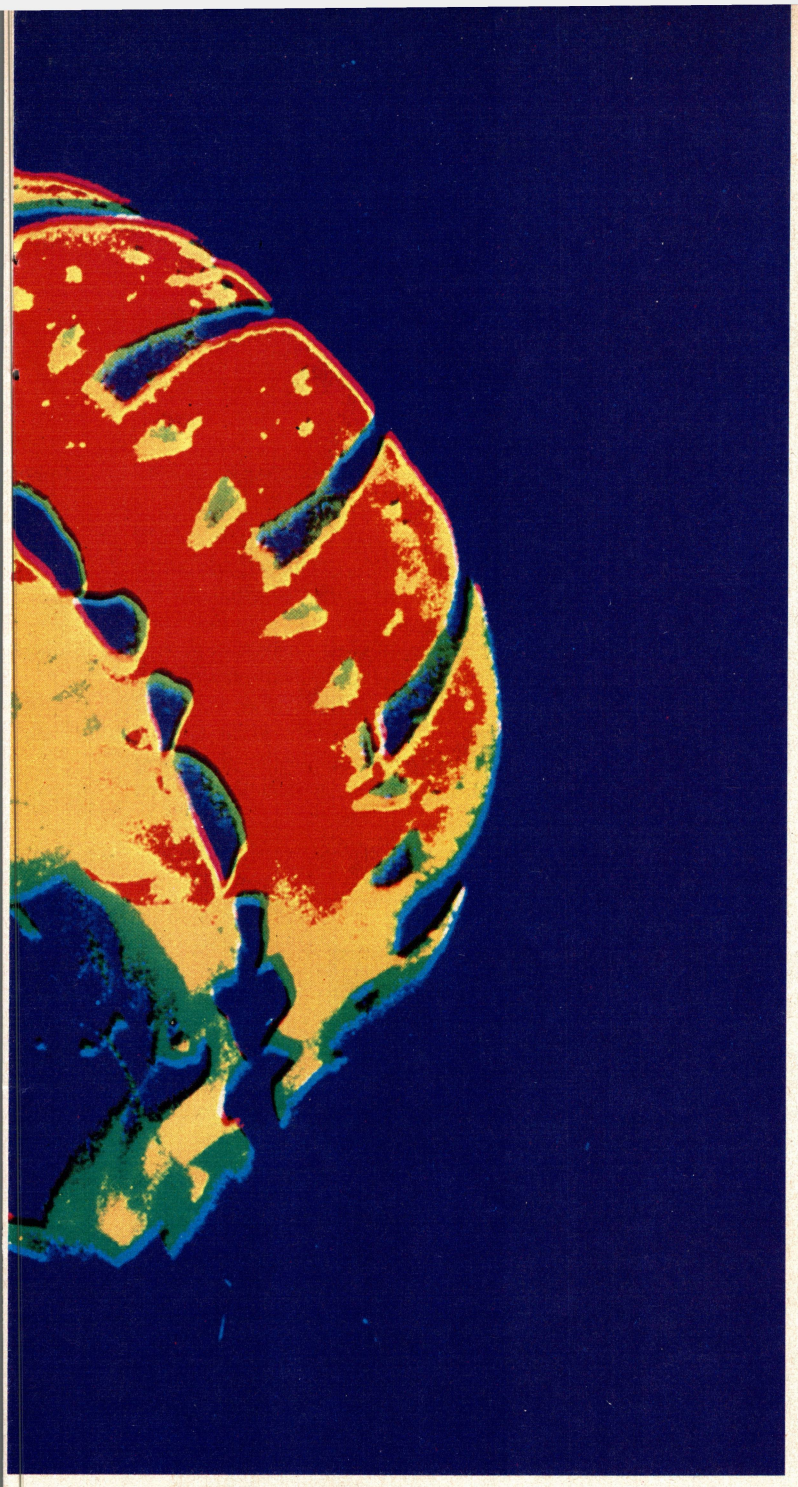
The rules presented in this article are not ironclad laws — you will break them when special effects are desired. But, by first having mastered the basic rules, you will be able to break them creatively. In the next issue, we will present some additional rules, including: backgrounds, curves, ovals, patterns and camera angle.











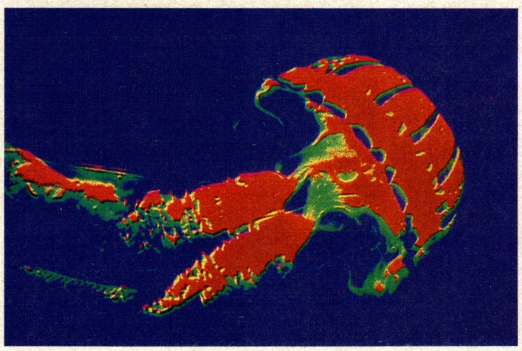
Don't Toss 'Em... POSTERIZE Those Pix

By Jeri McKeon and Jack Drafahl

Remember that muddy-looking color slide with the scratches etched in the emulsion that you just couldn't throw away? So you stuck it in a drawer hoping that someday its hidden potential would reveal itself? This is the day. By following seven simple steps, you can master the photographic art of posterizing which turns hopeless slides into dramatic surrealistic scenes. One muddy slide can create a combination of striking splashes of color and design, changing a technically wasted piece of film into a rich gallery of surrealistic art.

So dig out that slide. You know — that great one with a diver silhouetted against backlit strands of kelp. Or the one, think back now, where the garibaldi was teasing the crab. But wasn't the fish a little green instead of orange? Or the clump of sea anemones whose hues were brilliant underwater but turned to a washed out drab on the slide. Underexposed, overexposed, scratched, out of focus, off color or drab color slides can reveal vitality and beauty after you learn the posterizing process.

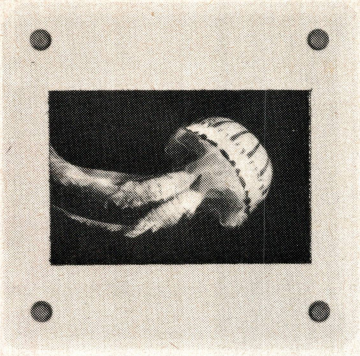
The steps are simple and, after committed to memory, are fast. From one color slide, several slides can be processed, each a different and spectacular work of art. To posterize a slide, however, you *must* have a slide





A poor original slide can be turned into prints with almost limitless variations using the posterization process.

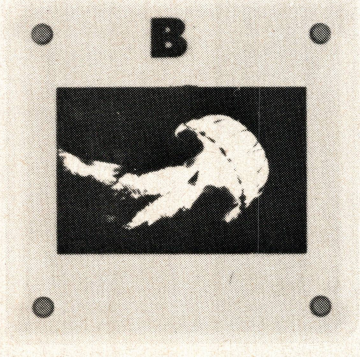
photography by Jack Drafahl

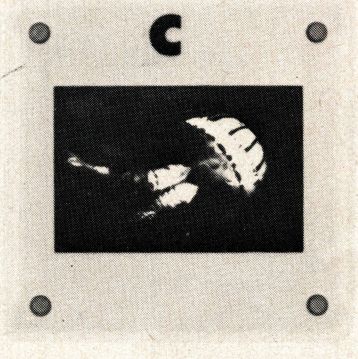




The top slide is the original picture which is going to be posterized. The second slide from top is a negative of the original. Slides A, B and C are copies of the negative shot with Photolith film: A is underexposed, B is at correct exposure, and C is overexposed. Slides D, E and F are copies of A, B and C photographed with Photolith. Slide G is a composite of two frames similar to B and F, sandwiched together to complete set.

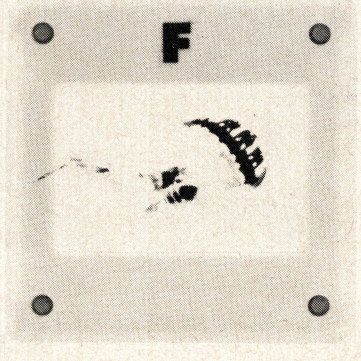






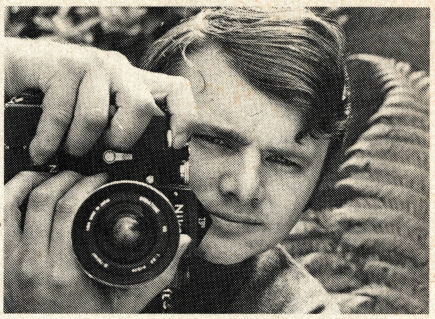


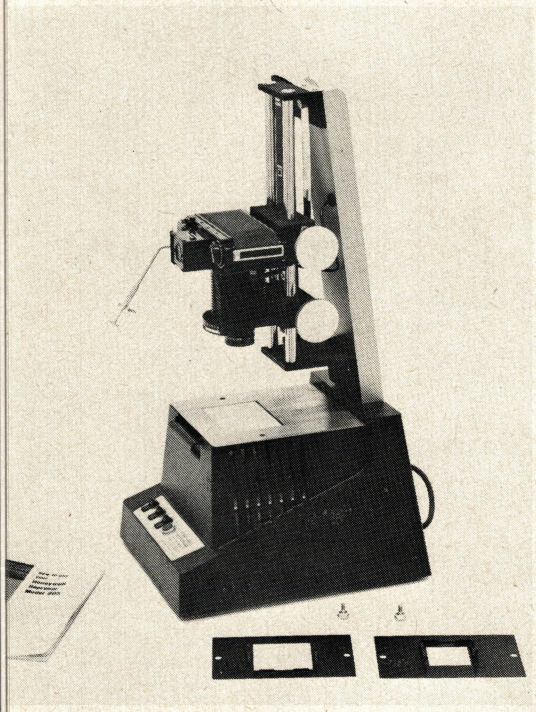






Jack Drafahl is currently with the public relations department of Brooks Institute of Photography in Santa Barbara, California. He is a graduate of Brooks, and has had many of his photographs published including underwater pictures in the Ocean World of Jacques Cousteau book series. Jack has collaborated with Jeri McKeon on a number of articles over the last three years. Jeri, a native of Santa Barbara, is city editor of Gardena Valley News, in Gardena, Ca.





To posterize a slide, some sort of slide copying system must be used which allows double exposures. Shown is a Honeywell Repronar, which sells for about $600. Photographers with the know-how can build a simple system.

copying system which allows double exposures. Nikon, Minolta, Honeywell, Bowen and many other major camera manufacturers have such systems. Or consult your camera's instruction book to learn how to set it for double exposures.

The two types of film used in posterizing are panchromatic and Photolith. A black and white panchromatic film is sensitive to all visible light and therefore must be developed in total darkness. Photolith film is not sensitive to red light and may be developed under a red safelight. Photolith now comes in 35mm size and may be found at some camera stores or by sending to: Photo Specialties, P.O. Box 60445, Los Angeles, Calif. 90060. Approximate cost is $2.35, which includes a mailer.

POSTERIZING PROCESS

Step One: Copy the original slide onto a slow panchromatic black and white film (Plus X is a good one). Make several exposures, recording each f/stop on paper. Select the negative with the best exposure and underline its f/stop. Use this same f/stop setting for exposures in Step Seven.

Step Two: Place the negative into a slide mount and return the original slide to your files.

Step Three: Copy the negative onto Photolith film making various exposures (f/stop 2.8, 4, 5.6, 8, 11, 16, 22). After processing, select the best three from this group and place them into slide mounts. The first slide should have no detail in light areas (Slide A). The second slide should have some detail in light and dark areas (Slide B). The third slide should have detail in light areas only (Slide C).

Step Four: Using another roll of Photolith film, copy slides A, B and C, making several exposures of each. After the film is processed, choose slides resembling D, E and F which are actually reversals of A, B and C.

Step Five: From the unused Photolith exposures, pick two frames similar to B and F and sandwich them together to form Slide G. This series of slides, A through G, will complete your set.

Step Six: Load your camera with a medium speed color film (Ektachrome X is commonly used).

Step Seven: Select any slide from set A through G and inset it into a slide copier. Place a color filter (red, green or blue) over the slide and expose it, using the f/stop underlined in Step One. Do not advance the film after exposure, but rather set the camera to double exposure. Select a second slide and expose it through a second color filter. Make sure each slide is placed into the slide copier the same way so each image registers with the last. The camera should still be set on the double exposure setting. Expose the third slide through the third color filter. After the third exposure, advance the film to the next frame for another combination of three slides with three color filters.

Sample combinations of slides and filters are D-blue, C-red, G-green/D-green, B-red, C-blue/ E-blue, C-green, B-red/ D-red, G-blue, C-green. With different shades of green, red and blue filters, and other exposures, an almost unlimited amount of combinations are possible.

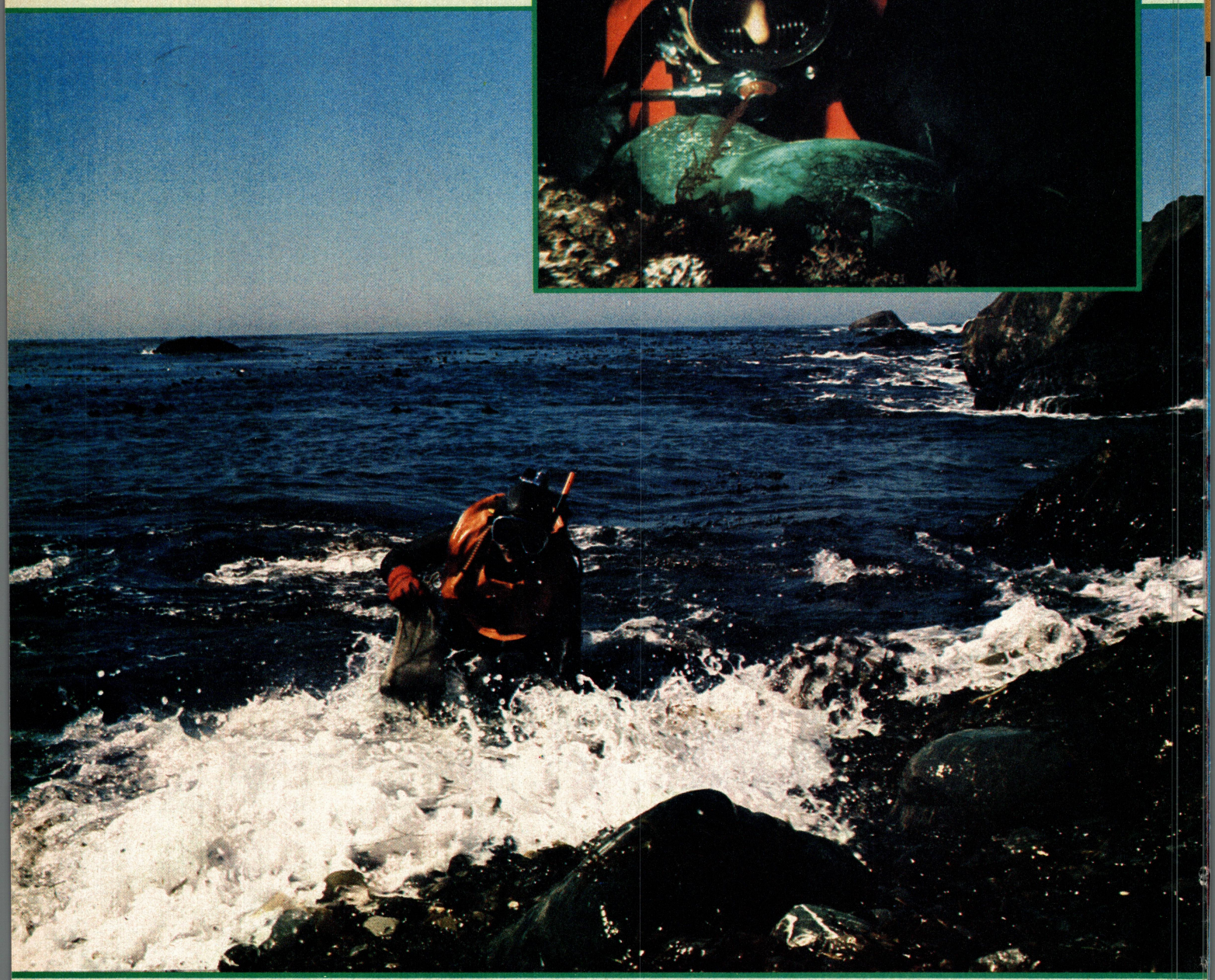
So now you've completed the steps and probably feel like you've just invented The Better Mouse Trap. Don't worry. All these steps can be easily memorized. Once learned, the posterizing process should take from two to three hours if you process the film yourself. However, to avoid the posterizing process entirely, send your slide to Kritter Labs, P.O. Box 4535, Milpas Station, Santa Barbara, Calif. 93103. Cost of three posterized slides from one original is $20.



photographs by Dick Barada



photograph by Don Wobber



Jade Cove is a unique geological formation which contains the only large deposits of jade ever found underwater. Jade can be imported from the orient at less than the cost of cutting and polishing the stone in the U.S., but there is a thrill in finding the jade itself, and natural jade can make beautiful jewelry.

Jade

This Ancient Symbol Of Mystery And Wealth Is Deposited In Great Quantities Off Central California's Rugged Coast.

By Bill Barada

Suspended in midwater beyond the surf I let myself drift with the surge of passing Pacific swells, enjoying a familiar, fluid world where everything moves to the undulating rhythm of the sea. Around me the long strands of a kelp forest swayed gracefully with the push and pull of the water. A school of small fish swirled back and forth, dancing in perfect time to the tempo of the waves, and even the jumble of rocks and boulders on the bottom seemed to join in the dance.

It was my first dive in Jade Cove and as I floated back and forth over the bottom I caught glimpses of the rocky canyons, ridges and ledges that make this one of nature's most unusual underwater treasure chests. The cove is a unique geological formation on the rugged central California coast which contains the only large deposits of jade ever found underwater.

As I explored the bottom I remembered what Ernie Porter, a commercial diver in Cayucos, had said about recognizing jade underwater: "Jade is heavy, looks green, feels smooth and slick, and some of it shines like a dim fluorescent light." I had heard that Jade Cove was actually the tip of an underwater mountain of pure jade and to me the entire bottom seemed to fit Ernie Porter's description. The rocky canyon walls were colored green and boulders as big as a house felt as smooth and slick as a bar of soap. Among the rocks I found hundreds of fragments that had a jade-green color, seemed to glow, and had a slick feel. Elated, I loaded my goodie bag with this treasure, wrestled the heavy catch through the surf, and triumphantly dragged my "jade" out onto the beach. But when Ernie inspected my loot he called it a wonderful collection of green rocks, colored glass, and similar worthless junk. Only two pieces were true jade, and Ernie said these were of such poor quality I should give them the deep six.

That was in 1956, shortly after Jade Cove first became popular with skin diving rockhounds. The experience convinced me that recognizing the difference between jade and pretty, green rocks is at least as difficult as recognizing a camouflaged abalone. And high quality jade is about as tough to detect as a buried halibut. But, like anything else underwater, it is easy after you learn what to look for and your eye is trained to separate the gems from the junk. Ernie Porter's bag was heavy with pieces of jade of all sizes, shapes and colors.

I've dived Jade Cove many times since and learned my first impression of swimming above a submarine mountain of pure jade was not too far from the truth. This unique area is a series of huge veins embedded in shelves of green serpentine rock that extend from the land into the sea. Countless years of abrasion have eroded away the softer rock and exposed the tips of jade ridges, carved out jade crevices and ledges, and dislodged monstrous jade boulders. Among the thousands of smaller pieces hidden among bottom rocks and tossed up on the beach are naturally polished stones which can be made into strikingly beautiful jewelry without additional refinement.

Jade Cove is located in Los Padres National Forest on the Carmel-San Simeon Highway (U.S. #1), about 65 miles south of Monterey and about 40 miles north of Morro Bay. This section of coast has been described as the wildest and most spectacularly beautiful shoreline in America. The narrow, two-lane highway is carved along the face of towering, rocky cliffs that plunge 800 feet straight down into the blue Pacific. Its hairpin curves snake around deep canyons and gorges that split the face of the cliff, and you cross high, narrow bridges above streams that plunge down the mountains into the sea.

At the base of the cliff is a jagged, boulder-strewn shoreline which is constantly pounded by giant ground swells and breakers that drive in from the vast reaches of the open Pacific. The surface of the sea is dotted with black rocks which project above the water like broken, snaggly teeth and a froth of white foam swirls in the turbulence of hidden, submerged reefs. When a big surf is running, these waters are extremely treacherous.

Storm driven ground swells and cresting waves have washed large vessels to shore and created seas too rough for Coast Guard vessels to put rescue lines aboard. Towering waves crashing against the shore have washed fishermen off rocks which are normally 50 feet above the water. Spray has drenched spectators standing on a ledge 200 feet above the beach. I watched a storm surf pound this coast with such fury that normally quiet coves churned as if agitated by a giant washing machine. Automobile-sized boulders rolled in the surge and rocks as big as a football were picked up and smashed against the cliff-face. Nobody in his right mind tries to dive this coast when a storm-surf is running big.

Diving in these waters can be dangerous for the inexperienced even under normal conditions. Large swells can materialize unexpectedly in an otherwise calm ocean and even a moderate surge creates rip tides and currents

that can sweep a novice out to sea. However, if you are accustomed to diving rocky reefs in a heavy surge and have an interest in gemstones, Jade Cove offers unsurpassed beauty and excitement. The area is popular with rockhounds who sift through the rocks on the beach in search of choice specimens. Some skin diving rockhounds will go to incredible lengths to obtain a choice specimen that has caught their fancy.

Don Wobber, a marine biologist at San Francisco State College, is one of these. He and three companions, Jim Norton, Gary Carmignani and Sonny Phillips, worked 10 months to extricate a 9000 pound jade gem from an underwater ledge at Jade Cove. Wobber has written *The Touchstone,* a book describing the adventure, and says, "The story is about how we get it, lose it in stormy seas, recover it again, and fight the State of California to retain possession. Our adventure borders on lunacy, and sometimes I feel as mad as Captain Ahab in his endeavor.

"We meet hippies and goldminers and 'mountain people,' are threatened by barroom pirates, find and talk about Indian artifacts, are stopped by a sheriff for stealing a 'national monument,' pull the resurrected rock through Chinatown in a celebration, suffer public meetings and public humiliation at the hands of the state, and finally gain possession of our rock, emerging like Ulysses somewhat changed by the adventure."

Wobber and Norton, with previous partners Perry Yelton and Ralph Ritchie, had retrieved other large jade gemstones, one weighing 700 pounds and another weighing 2400 pounds, which were donated to museums in San Diego and Oakland. The state has promoted Jade Cove as a boon to amateur rock collectors and never before has it indicated any interest in jade. The four and a half ton gem, named "Nephripod," is the largest single piece of jade ever recovered, on land or underwater, and the State of California became interested only after a newspaper article placed a dollar value on the stone.

The trouble began with a letter from the Mineral Leasing Department of the State Lands Division in Los Angeles. The letter stated in part, "Our information indicates that you have recently removed a five ton piece of jade worth approximately $180,000. Since this was removed without the state's permission, the jade belongs to the State of California. If you dispose of this jade without the consent of the state, you appear to be guilty of converting state property to your own use . . ."

This points up an interesting situation. The land portion of Jade Cove is in Los Padres National Forest which is owned and operated by the federal government. However, the ocean beyond the mean high tide line is under state control. Before federal park rules were established, jade was collected by the use of dynamite, derricks, trucks and boats rigged with heavy duty winches. The federal government, not the State of California, set up rules in favor of conservation. Today, you are not permitted to use any mechanized equipment such as hoists or winches which deface the land or damage the trails. But, you can bring up all the jade you can carry.

This puts a definite limit on the amount people can bring out. Jade is about three times heavier than an average rock and a piece not much larger than a football weighs around 50 pounds. The trail from the highway to the beach crosses a wide expanse of sloping meadow, then zigzags down the face of a 180 foot high cliff. To get a piece of jade, you must haul your diving gear down to the beach, maneuver across shallow rocks and through the surf, find it by diving in heavy surge, get it to the surface, and haul it back through the surf to the beach. Then, after accomplishing all this, you are still faced with the task of climbing the cliff with the weight of the jade added to your normal diving equipment.

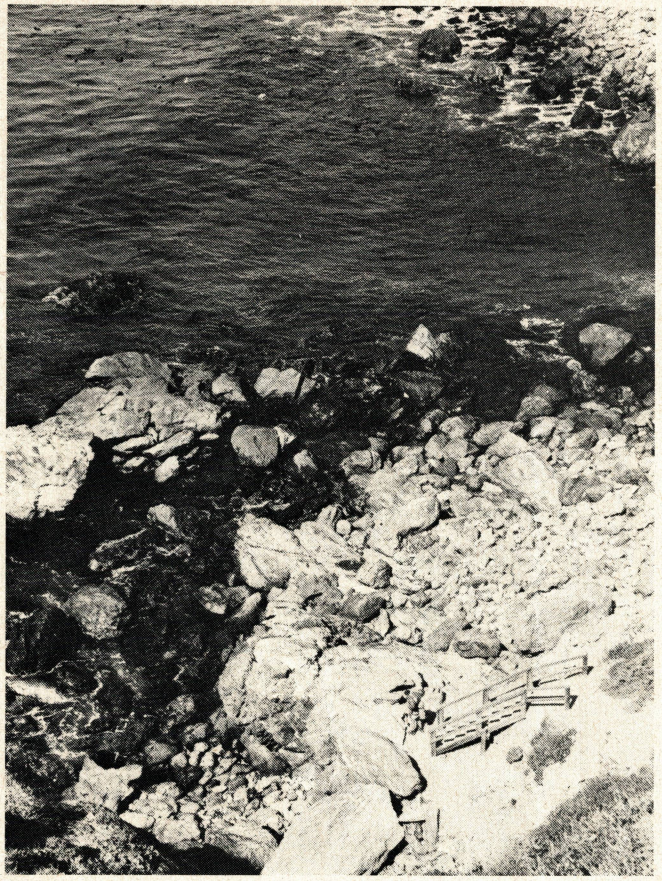
Most serious jade divers, such as Wobber and Norton, have rigged up special jade-carrying back packs for the climb and use lift bags underwater to raise large specimens. Their four and a half ton gemstone, Nephripod, was lashed to a platform underwater, raised with lift bags and 55 gallon drums, then floated a distance of two miles to Willow Creek which is accessible to vehicles.

Jade Cove is actually a series of coves covering a distance of about five miles between Plaskett Point on the north and crevice-channel on the south. The two most popular and most accessible coves are adjacent to the federal campgrounds and in his book Wobber describes these as Cove #1 and Cove #2. Describing Cove #1, he says, "Beneath the water on the south side of this cove running to the seaward is a vein of jade which humps up like a green dragon's back through the surrounding rock and gravel, disappearing and reappearing for several hundred feet . . . black jade is commonly found, or a mixture of black and green, and some of it is good quality. Jade seems more plentiful in #1, especially in recent years, but I think it is not as good quality or color as the jade in the cove a few hundred yards to the south, or #2. This was the first one I dove in and I call it Jade Cove . . .

"Jade Cove is my favorite. At the bottom of sheer green serpentine cliffs the cove is made up of mammoth piles of stone rubble . . . This rubble continues beyond the breakers and out into the sea. I like to search subtidally, swimming in among these broken and worn rocks and sometimes through long valleys where pebbles and sand have gathered into gentle ridges, like sand rifts in a desert. On the south side of the cove, shelved ridges of base rock stand up parallel to shore like the tattered backs of sleeping iguanas . . . Huge boulders dot the cove and some of these emerge from the water . . . The lower parts of these huge rocks are undercut and sometimes just above the coarse gravel that surrounds the base a green jade surface is revealed . . ." One of these is called Cave Rock because in an opening large enough to hold six or seven divers, U/W lights disclose solid walls of jade.

Wobber also tells how to recognize jade underwater. He says to look for, ". . . the green soapy feel and the lustrous green color. The surface of jade, being translucent, seems to glow underwater, regardless of whether the jade is green, black, or otherwise, the edges not having a defined appearance, but a fuzzy look that can be recognized with experience." A positive identification can be made by scratching a rock surface with the tip of your knife. If it leaves a visible mark, it is serpentine. Jade, like diamond, is too hard to scratch or cut easily, and it is one of the toughest rocks known. Diamonds are harder, but are brittle and will shatter more easily than jade.

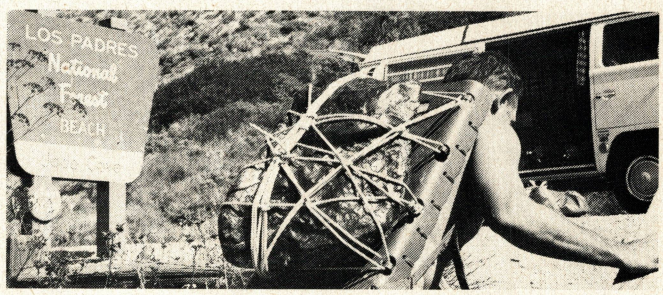
In some ancient civilizations, such as the Mayas and Aztecs, jade was valued more highly than gold or silver. Throughout the ages this translucent green stone has been a symbol of mystery, affection, religious worship and wealth. Its smooth, slick surface has created cultures which believe jade has aphrodisiac qualities when rubbed or



photographs by Dick Barada



The trail to Jade Cove from U.S. Highway #1 crosses a wide expanse of sloping meadow, and then zigzags down the face of a 180 foot high cliff. The beach is rocky, and large swells can materialize unexpectedly even on a calm day. Special back packs help serious jade divers on that long climb back to the road.



touched. Jade is still used by some people as a sexual stimulant today. This property is the basis of the title for Don Wobber's book, *The Touchstone,* and some cultists believe the larger the stone, the larger the charge. If true, the 9000 pound Nephripod should generate a lolapalooza.

Regarding the monetary value of jade, it is interesting to note that nephrite jade, such as that found in Jade Cove, was once valued more highly than Burmese jadite which is now popular. Jadite has the translucent emerald green color popularly associated with jade jewelry. However, pure jade is white, and all colors, including green, are due to impurities. Top quality jade can be almost any color, including black, white, gray, brown, purple, blue and green; or any combination of these. The quality is determined by the color and perfection of the stone, such as the absence of faults, fractures and similar defects. The nephrite jade found in Jade Cove ranges through all colors from pure white and pale green to rich black and brown.

Many collectors value these stones more highly than solid colors because of the intrinsic beauty and character of mixed color flow lines. However, the value of a particular stone is in the eyes of its beholder, and a gemstone from Jade Cove is worth whatever you think it is, or can get somebody to pay for it.

For prospective divers who may be planning a trip to Jade Cove, Don Wobber and Jim Norton have the following advice: Don't expect to find a ready market for jade at your local wholesale jewelry store. Top quality jade carving and jewelry can be imported from the orient more cheaply than raw rock can be cut and polished in the U.S. Jade is extremely tough and difficult to shape, and the time involved in cutting and carving would price it out of the market. The best market is among rockhounds and collectors who value a stone for its natural beauty. In this market, underwater jade has a special appeal because it is unique and is pre-polished by natural processes.

The best time to look for jade is after a storm surf has uncovered previously buried pieces. The worst storms usually hit in winter, but the colder water is more clear and kelp growth is not a major problem. The water is more calm in summer, but visibility is less, while in the fall, piles of rotting kelp on the beach attract swarms of stinging, biting flies and insects. Heavy rocks are best brought in on a high tide. Then, at low tide when they are high and dry, you can get them into a harness or pack. If possible, make your first trip in the company of an experienced rockhound who can identify quality stones and save a lot of disappointment and useless work.

Divers can stay at either of two campgrounds near the cove or at Willow Creek a short distance to the south, and cabins are available at Lucia, eight miles to the north. There are parking places for cars, campers and trailers along the highway or in the picnic area above Cove #1.

For divers who would like to try something different, Jade Cove offers a setting of spectacular natural beauty and an underwater treasure of unique gems of lasting value. And you can dive for jade with a clear conscience because the loose jade not taken by rockhounds is rapidly destroyed by natural erosion. (A section of the Nephripod chipped off by another rockhound was worn perfectly smooth in less than a year.) And, jade collecting has no adverse impact on the marine ecosystem.

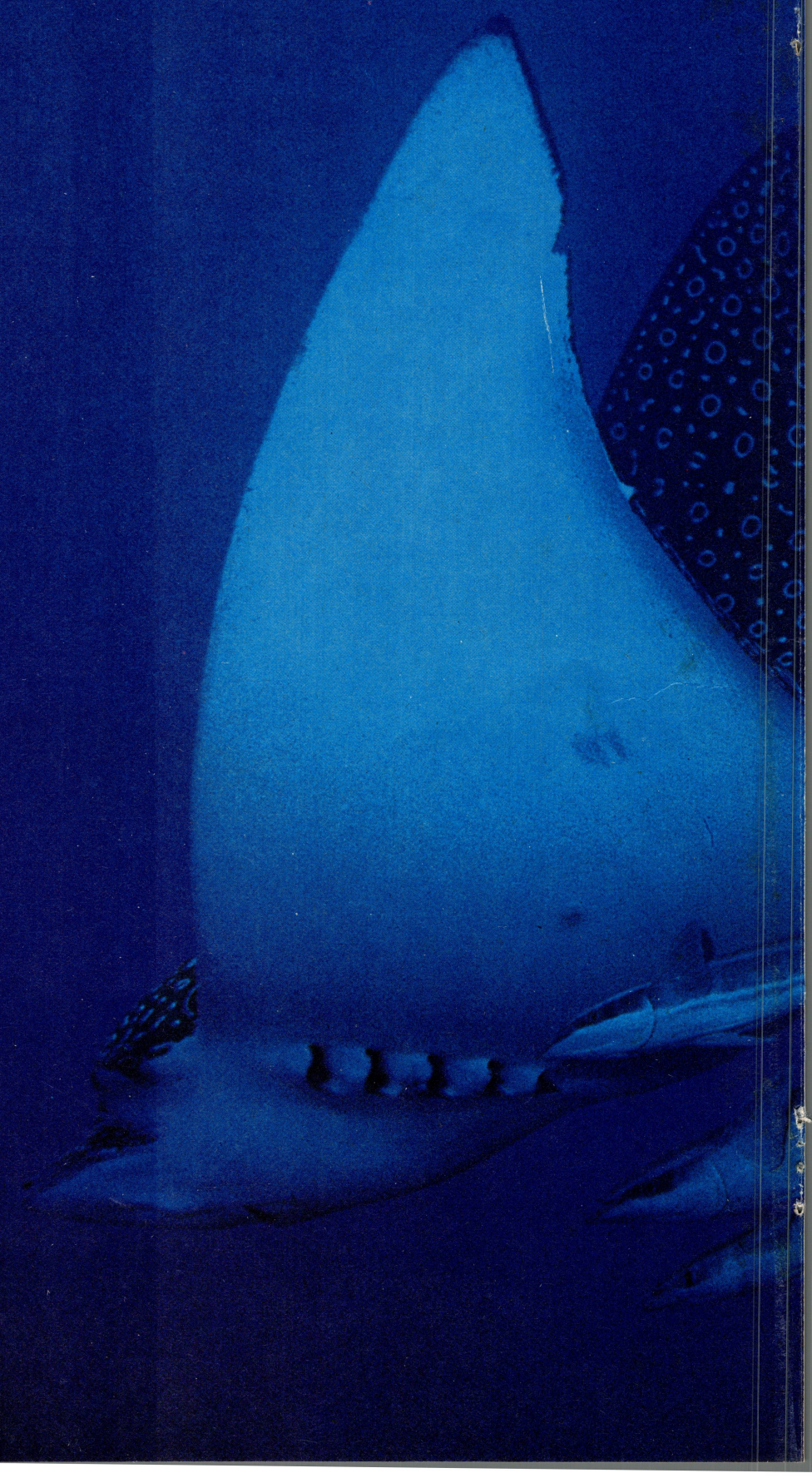
Ocean Gallery

With the grace and ease of beings perfectly adapted to their existence, the beautiful rays glide through water in total harmony with their environment. For 350 million years this group of fishes has followed its unique path of evolution: its pectoral fins have expanded into wing-like appendages, its body has elongated and become streamlined, and its tail has thinned out in most species to the point of being whip-like. Many species have also developed an effective defense mechanism in the form of a venomous sting which has dominated man's association with rays for millenniums.

Aristotle referred to the stingray in his *Historia Animalium,* and Lycophoran wrote of the death of Ulysses by a spear believed to have been tipped by a stingray sting. Nicander noted the venomous properties of the stingray in his poem "Theriaca," and Pliny wrote about the stingray's ability to kill a tree by stinging it. In the United States today, there are about 1500 stingray attacks reported each year! These aren't attacks in the aggressive sense of the word, though, but are usually the result of a person stepping on a ray in shallow water.

Most true stingrays spend a lot of their time half-buried in the bottom of coastal waters, the reason for their numerous encounters with man. The eagle rays, however, are active, free swimming rays like the mantas, and usually only settle on the bottom to feed. As they swim from area to area, they often play host to remoras, a type of fish with a dorsal fin which has evolved into a suction disk. Remoras will attach themselves to anything large — rays, sharks, whales, or even boats — to be towed from one feeding area to another. When they get to their destination, the remoras will swim off and leave the rays to eat alone.

The spotted eagle ray, *Aetobatus narinari,* is found in the tropical and temperate belts of the Atlantic, Red Sea and Indo-Pacific. Like many rays, the spotted eagle ray has one or more grooved spines on its dorsal surface



THE SPOTTED EAGLE RAY

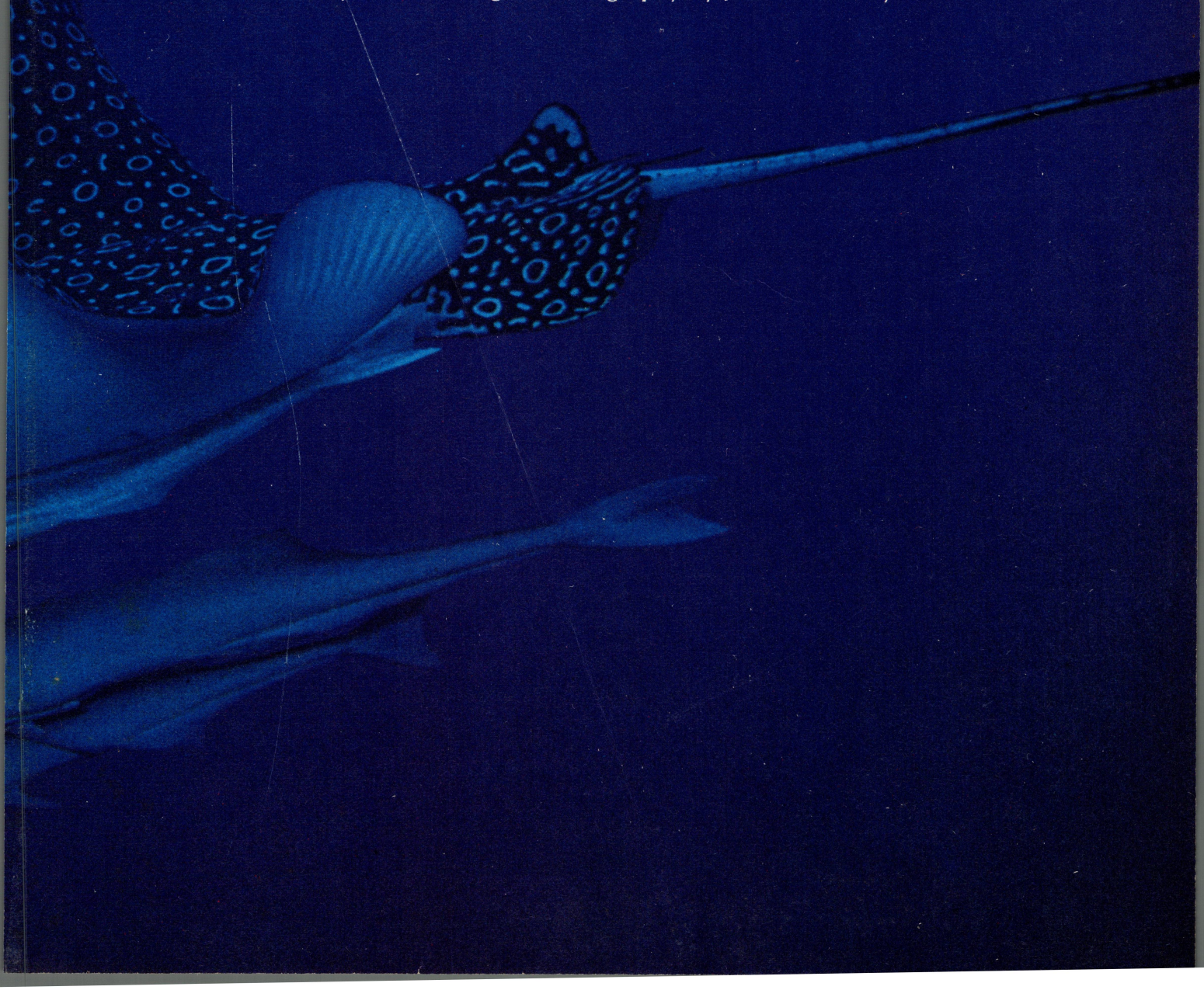
By Sherna Hough Photography by Jack McKenney

which hold venom glands. The sharply pointed spines can easily penetrate the victim's flesh, but are difficult to remove because of their recurvate, serrated edge. The venomous spine of the spotted eagle ray is located close to the base of its tail, rather than further along the tail as in true stingrays. When it is stepped on, then, it does not have as much leverage to whip its spine, so penetration may not be as deep as that of other rays.

The spotted eagle ray has compensated for this disadvantage in leverage by developing a relatively large spine with literally hundreds of barbs on it. These barbs lacerate the victim's tissues, aiding the absorption and distribution of the toxin to produce a violent reaction, or even death. As characteristic of all rays, however, the spotted eagle ray is very shy and it is believed that people can only get close enough to be stung because the senses of sight and smell in rays are not very acute. If any ray is aware of the presence of man, it will certainly flee rather than make an aggressive move.

Because of the spotted eagle ray's shyness, it is truly exciting for a knowledgeable diver to see this beautiful species in the open water. The spotted eagle ray is very easily identified by the many white or bluish white spots scattered over the upper surface of its body. The color of the body itself is slate gray or slate brown above, while the entire under surface is white. The expanded fins of this ray are pointed at the tips, and its head is large and prominent, bearing a muscular snout which gives this ray an animal-like face.

The teeth of the spotted eagle ray are united together to form a single, coarse, large grinding plate in each jaw. They use these plates to crack the shells of the mollusks which form the bulk of their diet. The tail is very long and slender and sometimes may be as much as four times the length of the body. A small dorsal fin is present just in front of the spine. Although most specimens measure between two and four feet in diameter, some have been known to exceed seven feet across. The spotted eagle ray is ovoviviparous, bearing its young alive after they have been fully formed, in litters of four to ten young. Although it is generally a shallow water ray, specimens have been taken at depths to 60 fathoms.





ADP

Something for Everybody

By Sherna Hough

Advanced divers programs . . . ADPs. What do they offer diving enthusiasts? For the novice the answer is fairly simple: they offer a more comprehensive training in scuba skills than the basic class, and lots of practice in the open water with a highly trained instructor by their side. For beginning divers, ADPs are obviously a good idea. But what can the advanced divers program offer for someone who has been diving for a number of years, in a number of different circumstances?

When I signed up for Los Angeles County's advanced diver program in June, 1973, I had been free diving for ten years and scuba diving for nine. My home ground had been northern California, but over the years I had had the opportunity to explore the waters off Hawaii, Baja California, Cozumel, British Honduras, the Leeward Islands and around the Mediterranean. I had been wreck diving, deep diving, night diving, freshwater diving, and had even tried my hand at hard hat diving. I had worked for a dive shop, a diving equipment manufacturer and an underwater film company, and had attended innumerable underwater symposiums and seminars. So what did ADP have to offer me?

When I registered for the course my main intention was to review the diving diseases. I had never quite gotten straight the difference between a subcutaneous emphysema and pneumothorax, and I thought it was about time I stopped pretending that if I didn't understand those terrible things they wouldn't happen to me. I was also new to the Los Angeles area and was eager to find out about the best dive sites in the area, to learn the ropes on the local charter boats, and meet some new diving buddies. On the other hand, I didn't consider myself a "super diver" by any means, and the course syllabus looked like it would fill in a lot of gaps in my experience.

Los Angeles County's 100 hour advanced diver program is a ten session course, stretching over a six month period from the pre-testing in June through the graduation ceremonies in late November. Each session consists of two very important parts: a three

hour seminar on Friday nights, and about six hours of related open water work the following Sunday. Each session covers a different aspect of diving, and must offer something new for just about everyone. Topics covered include: diving oceanography; diving equipment — function, care and operation; dive tables, NuWay tables and the decompression meter; first aid and emergency procedures; unique medical aspects of diving; underwater photography; cave, wreck and night diving, search and salvage; local and dangerous marine life; fish and game regulations; methods of taking game; marine preparation, preservation, aquarium science and shell collecting.

As I said, there was something for everybody. But the real fun — and challenge — was actually doing all of those things in the Pacific Ocean, come rain or come shine. The day we had to practice salvage techniques, for instance, the water was quite turbid, we were shallow and I wasn't weighted sufficiently, and I had practiced the wrong knots the night before. The exercise was to put a rope through a pipe, then tie both ends to chains which were attached to a wooden board. On the beach I would have had trouble with that one, but underwater in the surge, while I was using most of my energy just trying to keep down, it was an absolute riot. I almost drowned because I was laughing so hard, but I sure learned to have more respect for salvage divers.

And then later that same day, while we were trying to hammer two boards together underwater with the boards floating upward and the hammer sinking downward and the nails slipping every which way — well, the funny stories could go on and on. But most of us weren't laughing all of the time. Many a vest was torn as we practiced rocky beach entries, many a regulator filled with sand while practicing high surf exits, and many a breakfast was lost on boat trips to Catalina — they really put us through our paces! But by the time we had finished the course we knew how to patch our own equipment, clean a regulator, and eat during picnics on the beach like there was no tomorrow.

Over 140 people signed up for L.A. County's ADP. To make the water work feasible with that many participants, they divided us into nine dive teams according to the areas of the county we lived in. Each dive team had two team leaders, who were volunteer

photograph by Ralph M. Singer



photograph by Jack McKenney

ADP teams made a lot of "fun dives" on their own during the summer.

teachers from the L.A. County Instructor's Association. Each team was assigned a color, which was displayed on all diving gear for immediate team identification in the water. During the course of the program, most teams also thought up a name for their group and had a team flag made.

A lot of the team flags were really funny, with Deep Float being one of the favorites. My team, however, had more women than men on it so our flag had a bright green field with the silhouette of two dancing divers stitched on it in purple. Some of the divers thought our flag was silly, but when it came to team competition, our group was nothing to laugh at. One of our team members, in fact, won the award as Outstanding ADP Graduate of 1973. Mary Wright was truly outstanding in all of the things we were evaluated on: participation, watermanship and academics.

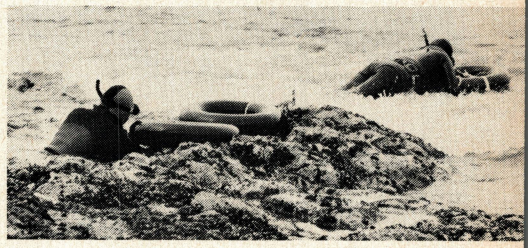
Academics — yes. We were quizzed at the beginning of each seminar on the subjects covered during the previous session, and there was a midterm test and a comprehensive final exam. We were also asked to do a cove survey — an extensive study of one diving location in our area. The survey was to include geographical features of the site, access, underwater aspects, nearest dive shop, telephone and hospital, all written up and well documented by photographs. The surveys were graded by the staff, then turned in to the Underwater Unit and eventually served as public information for interested divers.

There was one other requirement for this extensive course: that we made a minimum of six logged dives separate from the ADP program — two beach dives, two rocky dives and two boat dives. And then there were the optional specialty training events, such as the full day at the facilities of the Commercial Diving Center in Wilmington, Calif., where we tried our hand at using various types of commercial diving equipment, including hard hat equipment during a dive in Los Angeles Harbor. It was a gas.

With all of this, plus the diving we did for fun "on the side," many of us were making as many as three dives per week, and by the end of the summer I thought I would have brine shrimp growing in my ears. It was a fantastic experience, though, and I really did learn a lot. Specifically I learned things like how to handle a speargun (we practiced on chlorine bottles suspended in midwater with a rope and anchor); how to navigate underwater with a compass (I had always gone by "the seat of my pants"), and how to work the repetitive dive tables in my sleep (I had always used a decom meter). I had also learned a myriad of hints about making diving safer, easier and more fun under a wide range of circumstances. Most importantly, however, I learned once again of the infinite variations that our sport offers us — all of the stimulation, fun, and exploration that keep me diving year after year.

When the people at the Aquatics

photograph by Ralph M. Singer



Regular ADP sessions included six full hours water work every other Sunday.

Division of L.A. County's Department of Parks and Recreation set up the ADP course in 1965, they hoped "to expose interested enthusiasts to the vastness of underwater fields and to ultimately create active but safety-conscious scuba divers through a stimulating and challenging curriculum." They wanted to fill the gap between certified beginners and expert divers, and I believe they have succeeded admirably. I would highly recommend an advanced divers program for any enthusiast, whether it is their first year at the sport or their twentieth. For more information about L.A. County's program, contact: Tom Ebro, L.A. County Dept. of Parks and Recreation, 155 Washington Blvd., Rm. 1202, Los Angeles, California.



Treasure of Nuestra

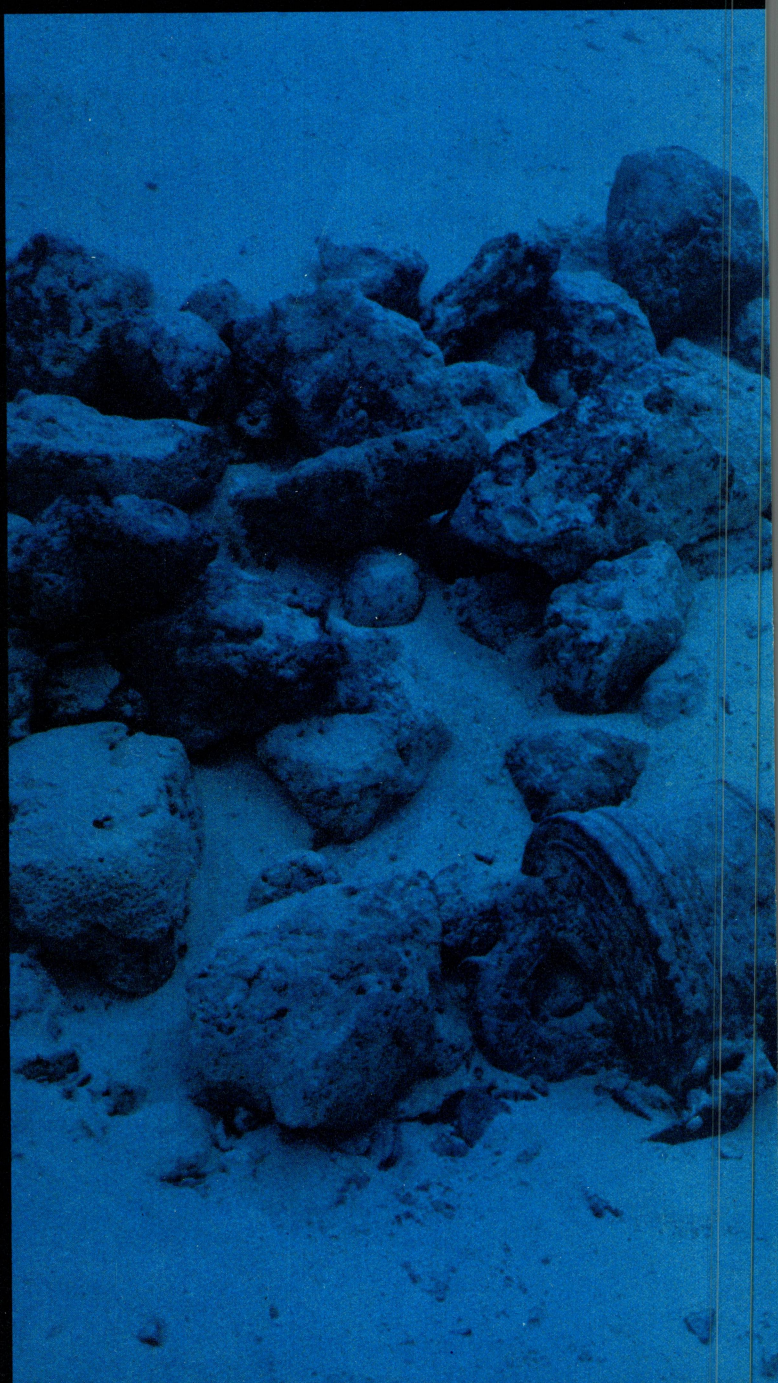
Millions Recovered Already - Attempt At The Mother Lode To Be Made Next Month



photography by Author







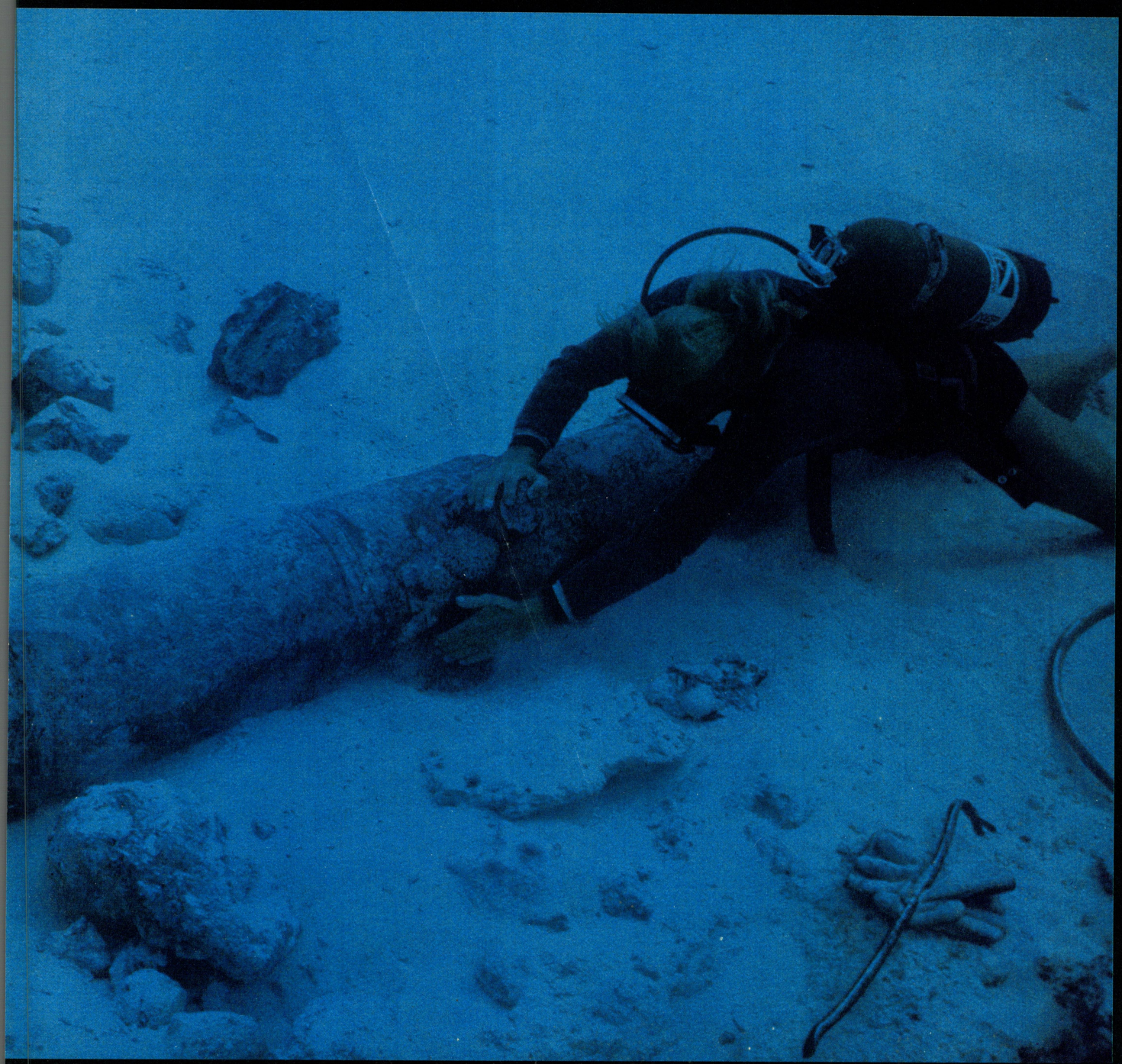
The silver pieces of eight, the 10 inch high silver pitcher, and the five pound gold disk, gold coins, emeralds and amethysts shown represent just a fraction of the wealth recovered from the Maravilla treasure. Two identical 11 foot long cannons, bearing the date 1653 and the name of the man who cast them, Johannes von Horst, were also found.

Senora de la Maravilla

By Robert Marx

On the morning of February 13, 1654, the Consejo de las Indias held a special meeting in Madrid at the orders of Philip IV. The evening before, news had reached the royal court from England that Oliver Cromwell, the Lord Protector of England, had ordered a large fleet of ships readied for a voyage to the West Indies. Although England was then officially at peace with Spain, the members of the Consejo realized that such a fleet could only be sent out to cause Spain serious harm — either to attack and capture one or more of the Spanish colonies, or to make an attempt on the returning treasure galleons later that year. To prevent the latter occurrence, the Consejo decided that an armada should be sent as quickly as possible to the Indies to bring the treasure back to Spain.

As soon as the president of the Casa de Contratacion in Seville received orders to dispatch the armada, prepar-





ations got underway and Cadiz and Sanlucar de Barrameda became scenes of frenzied activity. Finally on May 16, 1654, the Real Armada de la Carrera de las Indias; consisting of eight large galleons, four merchant ships (naos) and two smaller vessels (patches) under the command of Capitan General, the Marques de Montealegre, set sail from Cadiz for the Indies with orders from the king to pick up the treasure from Tierra Firme and return to Spain before the English reached the West Indies.

After an uneventful voyage the Armada reached Cartagena de las Indias on August 22, 1654, and word was immediately sent overland to the Viceroy of Peru to have the treasure shipped up to Panama. On October 18, 1654, the Armadilla de Mar del Sur; consisting of two galleons—the Capitana and Almiranta—sailed from the port of Callao with more than ten million pesos in treasure filling their holds. During the night of October 26, the two ships unexpectedly found themselves in shallow water off the coast of Guayaquil, Ecuador. After striking some rocks a few times the Almiranta managed to escape the danger and reached Panama, but the Capitana wrecked on Chanduy Reef and was totally lost. Meanwhile the Armada of the Marques de Montealegre was anxiously awaiting in Cartagena for news of the arrival of the treasure.

The president of Panama quickly dispatched salvage vessels and divers to Chanduy. By the middle of March, 1655, the salvors had recovered more than 2,800,000 of the five million pesos in treasure from the sunken Capitana, including a solid gold statue of the Virgin Mary holding the Christ Child. Then, all of the treasure from both galleons was transported overland to Porto Bello, Panama, and after the arrival of the Armada of Montealegre, a grand fair was held in celebration.

On May 13, just as the Armada was preparing to sail for Havana and Spain from Cartagena, news reached that port that an English fleet of 56 large warships had lain seige to Santo Domingo, so Montealegre decided that it was too dangerous to sail. By this time, unknown to Montealegre, the English had been repelled from Santo Domingo and had gone on to attack and capture Jamaica.

On July 1, an advice boat reached Cartagena from Spain with orders from Philip IV that the treasure must reach Spain as quickly as possible regardless of what dangers were involved; so two days later the Armada set sail. As it approached Cabo San Antonio, the western tip of Cuba, a small boat advised them that 27 English warships had been sighted in the vicinity several days before, so Montealegre took his Armada to Veracruz, Mexico, to keep it out of English hands. On August 25, word reached Veracruz that the English fleet had abandoned their blockade of Havana and had sailed for England, so the Armada then sailed for Havana; after embarking more treasure and goods from Mexico and the Philippines.

The Armada reached Havana on October 10. Many of the ships were in dire need of repairs, so more time was lost while this was accomplished. Although Montealegre had eight galleons capable of carrying the treasure, he decided to carry the majority of it aboard his own Capitana, the *Nuestra Señora del Limpia Concepcion;* and the Almiranta, the *Nuestra Señora de la Maravilla,* commanded by Admiral Mathias de Orellana. Each of these ships carried more than five million pesos in treasure—gold, silver, jewelry, precious stones and pearls plus some cochineal, indigo, sugar and dyewoods.

After all who were sailing had heard mass in Havana's great cathedral, the ships left port at noon on January 1, 1656. Around midnight on January 4, the lookout on the Almiranta *Nuestra Señora de la Maravilla,* which was the lead ship of the Armada, discovered that they were suddenly in shallow water on a sand bank and a cannon was fired to warn the other ships to head away from the danger. In the confusion that ensued, mainly because the ships' pilots thought they had already passed through the dreaded Bahama Channel and were in the open ocean and, in addition, were unsure why the *Maravilla* had fired a cannon, several of the ships continued on their original headings and one of them collided with the *Maravilla.* The *Maravilla* received a large hole in her bow below the waterline and began to fill rapidly, despite the fact that all four of the ship's pumps were manned and everyone aboard the stricken galleon was bailing with whatever was available. Seeing that there was no chance of saving the ship, Admiral Orellana decided to run the ship aground to prevent her from sinking in order to save as many lives and as much of the treasure as possible.

In less than 30 minutes after the collision, the galleon struck violently on a coral reef and then slid off, finally sinking in about 50 feet of water. No sooner had the ship settled to the bottom, when a strong northerly wind began to blow, creating enormous waves and the ship began to break into pieces. The majority of the 650 souls on the galleon grabbed hold of floating pieces of debris and drifted away, never to be seen again. About 150 others clung to pieces of the galleon which still stuck above the water, but many of them died from exposure during the night and were eaten by sharks as they fell into the water.

By sunrise there were only 45 survivors and many of these were in bad condition. Another galleon of the Armada had also struck a reef but miraculously lost only her rudder and had anchored about a league north of the lost *Maravilla,* while the rest of the Armada had escaped danger and continued on their way to Spain. Despite the storm which was still raging, the 45 survivors were rescued and carried to the other galleon which was commanded by Captain Juan de Hoyos. After a new rudder was built and buoys were placed on the site of the wreck, by which time no part of her was visible, Hoyo's galleon left for Spain.

However, very little of the treasure was destined to reach the coffers of Philip IV. An English squadron was waiting for the Armada off Cadiz and managed to capture or sink all of the ships except for two small vessels which were not carrying valuable cargo.

After suffering another great storm south of Bermuda, in which Hoyo's galleon was further damaged, he headed for Puerto Rico to make repairs but as he approached the island contrary winds stopped him from entering any port there and he continued on to Cartagena de las Indias, arriving on March 10, 1656. After learning of the loss of the Almiranta, the Governor General of Cartagena dispatched six frigates with 40 divers and a large number of soldiers, under the command of Capitan Juan de Somovilla Texada, a military engineer then in charge of building fortifications in Cartagena, to find and salvage her. The salvage vessels reached the site of the wreck, which was on the Little Bahama Bank, around the middle of June, 1656, and found that the *Maravilla* had been broken into

Robert F. Marx is 39 years old and a resident of Satellite Beach, Fla. He has been diving since age 11, and was one of the original members of the Los Angeles Neptunes. Marx is more of a marine archaeologist than a treasure hunter, and has worked in this capacity for the governments of Spain, Lebanon, Tunisia, Portugal, Panama, Colombia, Jamaica, and others. Locating and salvaging ancient shipwrecks and sunken cities has been a full time occupation with Marx ever since he left the U.S. Marine Corps in 1955 after serving three years as a diver. Among the many projects he has led, his excavation (1965-1968) of the sunken city of Port Royal, Jamaica—which sank in 1692—is probably his most important accomplishment.

Marx has had 15 books published covering such subjects as naval warfare, Spanish treasure fleets, marine archaeology, treasure hunting, and about his own adventures. His book **Shipwrecks of the Western Hemisphere** is well known to most wreck buffs. Currently he is writing two books: **Precolumbian Voyages to the New World** and **A Manual of Underwater Archaeology.** He has written more than 200 articles and scientific reports. Marx was the organizer and navigator of the authentic reproduction of the **Nina II,** a replica of Columbus' smallest ship, on the voyage from Spain to San Salvador, Bahamas in 1962. As a result of this voyage he was made Knight Commander in the Order of Isabel the Catholic by the Spanish government. In 1964 and 1969 Marx sailed as captain on two authentic tenth century Viking ships, both of which unfortunately sank before reaching America. Currently he is formulating plans to build a fifth century B.C. replica Phoenician ship, which he will sail round trip from Lebanon to Mexico in 1976.

Over a period of 20 years Marx has recovered somewhere between 10 and 15 million dollars of treasure and artifacts, both from sea and on land. This past spring Marx worked as a visiting lecturer in marine archaeology at the University of California at San Diego and Scripps Institution of Oceanography.



many small pieces and scattered over a large area. In 13 days they managed to recover 480,000 pesos in treasure; then a bad storm struck and they had to run for a safe port. Four of the ships carrying the salvaged treasure were lost — two on the coast of Santo Domingo and two on a reef off Cayo Gordo in the Bahamas. The two remaining vessels managed to reach San Juan de Puerto Rico and later were used to salvage most of the treasure off the other four which had been lost.

During the following three years other salvage vessels managed to recover about one quarter of the *Maravilla's* treasure, but when they returned for the fifth season of salvaging, they were unable to find any trace of the shipwreck which had been completely covered over by shifting sands. For more than 20 years repeated attempts were made to locate the wreck — which not only contained the greatest treasure ever lost on a single ship, but also the gold statue of the Virgin and Christ Child which had been sent from Lima. It appeared that the *Maravilla* was lost forever; but such was not the case. For I was to find her more than 300 years later.

I first became fascinated by the story of the *Maravilla* in 1960, while doing original research in the Archivo General de las Indias in Seville. After locating more than 12,000 pages of documents dealing with this ship — including a copy of her original cargo manifest, which listed and described every item she carried when lost — I came across a 144 page book published in Madrid in 1657 by one of the survivors of the wreck, Doctor Don Diego Portichuelo de Ribadeneyra, who had been the "Procurador General del Tribunal de la Inquisicion de Lima." This gentleman wrote an exciting and vivid account of everything he observed from the time he boarded the Almiranta of the Armadilla de Mar del Sur until he eventually reached Spain.

I also found three difficult nautical charts showing the precise location of the shipwrecked *Maravilla* and knew then that she could be located with proper equipment.

Early in 1972, with the help of Willard Bascom, the famous oceanographer, we raised a substantial amount of money and formed a corporation — Seafinders, Inc. — to search for and salvage the *Maravilla.* After obtaining a salvage lease from the Bahamian government and carefully putting together the best in equipment and personnel, we initiated a systematic search using a proton magnetometer which detects the presence of ferrous metals.

Unlike most shipwrecks which contain large masses of ferrous metal in the form of iron cannons, the *Maravilla* carried 58 bronze cannons making her a very difficult target to locate. In addition, we were searching in a section of the notorious Bermuda Triangle where electronic equipment seems to function properly only in a very sporadic way. There were periods of days at a time when we were unable to use the marine radio and on two occasions we were almost hit by hurricanes before we heard of their approach by radio and could beat a retreat to port.

From the start I was convinced that we would eventually find the wreck, but as the long grueling days of searching dragged into months, the rest of my crew lost heart and began to wonder if they were not on a wild goose chase. By the middle of August we had covered more than 50 square miles of the bank, finding around 20 other shipwrecks in the search process; but not a sign of the elusive *Maravilla.* Bascom, who controlled the purse strings of the operation, repeatedly tried to convince me to give up the search and head for Colombia where we had several other good wreck locations, but I refused to admit defeat.

Although we were using the most advanced methods to search, we finally found the *Maravilla* not with the aid of science but through a piece of good luck. On August 20 we were about to head for port for supplies. As David Edgell, one of the divers, and I pulled up the anchor of our main vessel, the *Grifon,* we found two Spanish-type ballast stones stuck in its flukes. I quickly threw a buoy overboard to mark the spot and headed for port. We had been finding wrecks all summer with similar ballast stones on them, but this time for some strange but compelling reason, I knew we had found the *Maravilla.*

Three days later we were again over the spot where I had dropped the buoy. Diving down I found a small coral reef which was covered with ballast stones from the period of the *Maravilla.* The reef was surrounded by deep sand and I was positive the wreck was buried beneath it, so we positioned the *Grifon* and began excavating with the blaster — a tubular metal device that fits down over the ship's propeller and deflects a steady stream of water downward to blow away the sand. David and I were on the bottom when the blaster cut through approximately 25 feet of sand and laid bare the hard limestone bottom which was covered with more ballast stones, ceramic sherds and coral-encrusted iron objects. David found a clay smoking pipe and seconds later I found a piece of eight dated 1655 and my heart was jubilant for we had indeed found the *Maravilla.*

An hour or so later a rival group of treasure hunters which had been shadowing us all summer, appeared in their vessel. I went aboard and convinced them that we were excavating a U.S. Civil War shipwreck. The leader of the group ironically told me that I would never find

the *Maravilla*. He said she was ten miles north. At that moment we were right on top of the site and our divers were bringing up treasure. By sundown we had recovered a beautiful gold dish in the form of a large scallop shell with two silver spoons, one silver fork, a silver ink well, a silver snuff box with two pairs of brass navigational dividers attached to it by coral growth, and a number of other valuable artifacts.

The following day we located four of the ship's iron anchors, ranging in size from 5 feet to 22 feet in length. The smallest was probably used aboard one of the ship's longboats (chalupas) and the others for the *Maravilla* herself. Nearby we discovered two very ornately decorated



This 72 pound silver ingot found on the Maravilla *is marked with the weight of the bar, the owner's initials, the tally number, fineness of silver, assayer's bite and duty paid.*

bronze cannons of 18 pound shot. Both were identical — 11 feet long and weighing about two tons — and bore the coat of arms of Philip IV. They also bore the coat of arms of the Marques de Leganes, and an inscription stating the Marques de Leganes had donated the money for these cannon to be used on the ships of his most sovereign King, Philip IV.

Under one of the cannon, which was resting on some loose ballast stones, I spotted an intact ceramic jar about four feet high. Throughout the period of navigation between Spain and her New World colonies, these "olive jars," as they were called, were employed to carry everything from wine to gun powder and even at times to transport coins. It was a mystery how such a fragile container could have survived intact under the weight of that enormous cannon. Working as cautiously as a surgeon I managed to extract the jar and when I reached the surface with it, I discovered that it still was sealed with a cork and was filled with wine. When we sampled the wine, however, we were disappointed to find it had turned to a bitter vinegar.

In the small area of bottom where we found the anchors and cannons we also found 600 silver coins, several small silver bars, four silver plates, two silver cups, a silver pitcher, a brass apothecary mortar and pestle and hundreds of other artifacts. The silver coins we were recovering were mostly pieces of eight (reales de ocho) but there were also a small number of four and two real pieces minted at the three chief Spanish American mints: Lima, Potosi and Mexico City. The small silver bars were assayed and made into bars in the refinery at Potosi as revealed by the markings on them. One of the silver plates had "J.M.D." marked on it, probably the initials of the owner.

We continued to work on the wreck and were off to a fine start the morning of the fifth day as the first hour's diving yielded more than 2000 silver coins, five large clumps of coins weighing over 150 pounds which were held together by coral growth, dozens of silver items and a complete sword. Then, as the blaster was gently blowing the pale sand away and enlarging the hole, David found the first of many gold coins we were to find and I suddenly spotted five silver bars being uncovered as I filmed the entire scene. After pointing to the bars, David stuck the gold coin he had found in his mouth and with great effort carried each of the five bars, which weighed about 70 pounds apiece, directly under the stem of the *Grifon* and put three of them in the "goodies basket," a wire basket we had rigged to haul up artifacts. Just as the basket almost reached the surface, the rope parted and the basket, with its precious load, came falling down through the water almost landing on top of us.

After all five bars were safely on the deck of the *Grifon*, I cleaned the coral-encrustation and a thin coating of silver sulphate off them and found that they all bore beautiful markings — the mint, assayer and tally marks, plus the mark indicating that the "Royal Fifth" (the king's duty) had been paid, the "bit" taken out by the assayer to show he had taken a small part of the bar to pay him for his labor. Even more interesting were the special markings on each bar in the form of initials denoting the bars' owners. From my copy of the *Maravilla's* original manifest I was able to determine that two of the bars belonged to a merchant named Juan Fernandez de Orozco, another to a man named Antonio Peralta and the last two to none other than Doctor Diego Portichuelo de Ribadeneyra — the survivor who wrote the account of the disaster. After having read his book so many times I had come to feel I knew the man and finding the two large silver bars which had once been his made me feel even closer to him.

By the time it became too dark to continue diving that day we had recovered more than an estimated $200,000 worth of treasure and it broke my heart to have to head for home port in Florida. Bascom had gone to Nassau to meet with government authorities to establish our ownership of the wreck and I needed to hire more divers because David and I had been spending 10 to 12 hours each day on the bottom and couldn't continue at that exhausting pace any longer.

Treasure has an insidious way of warping men's minds and values and this time proved to be no exception. After reaching port our cook disappeared taking several sacks of silver coins and was never heard from again. And our captain, who I had thought a very nice fellow, suddenly decided that his share of the treasure wasn't enough and demanded about ten times the amount he had signed an agreement to accept before we began the search. When we couldn't meet his demands he quit and revengefully immediately contacted many treasure hunters attempting to sell the precise wreck location to the highest bidder. Fortunately for us the wreck lay in the area for which we already had a salvage lease with the Bahamian government so it didn't really matter who else knew the location. However, this didn't preclude future problems because once the secret was out every pirate diver around wanted a piece of the action and we had to drive more than a dozen salvage vessels away from the site.

With three new experienced divers — John Hollister, Michael Daniels and Neal Watson, and a rugged captain named Charles Sherman — we returned to the *Maravilla* and worked her for six weeks before we were forced to stop. Our first two days back on the site were like the

last day before we had returned to port and at times treasure was being uncovered so fast that we had to have all five divers on the bottom at the same time. Sherman almost broke his back pulling up the goodie baskets filled with treasure and artifacts.

Our finds included more than 2000 silver coins, two silver bars, and many other silver items such as plates, bowls, cups, pitchers, spoons, forks, knives, riding spurs, buttons, sword handles, and candle stick holders. We also found 12 more gold coins which were of great value as I later discovered, because they turned out to be minted in Bogota and are the oldest known gold coins minted in the New World. Not all our finds were gold and silver for we recovered thousands of items of copper, brass, pewter, lead, wood, ivory, bone, horn, ceramic, glass and stone. Among some of the most interesting were beautifully decorated sherds of Chinese porcelain, a Mayan Indian jade axehead, a large three-legged stone metate (used for grinding corn in Central America), a number of human bones, fragments of cotton and woolen clothing and part of a human hair wig.

During these same two fruitful days we also recovered more than three tons of coral encrusted iron objects, the majority of which were ship's fittings and spikes that were used to fasten the ship. We were also delighted to find among the many iron objects seventeenth century hammers, axes, chisels, keys, padlocks, swords, knives, cannon balls, kettles, pots, pans, serving ladles and a wheel off one of the cannon carriages. These objects attesting to the routine of life aboard ship brought home to us, more than did the items of gold and silver, a feeling for the *Maravilla*, her crew and passengers and their ill-starred voyage.

Although diving conditions in the Bahamas are quite good, we were all diving from 10 to 12 hours a day and in spite of the relatively warm water the strain began to show on each of us. We all lost weight, despite the bountiful meals prepared by Capt. Sherman, and then began to suffer bleeding gums, ear aches and other annoying minor pains. A major problem was badly lacerated fingers and hands caused by small fish and crabs which were attracted to us by the various types of minute marine life uncovered as the blaster removed the sand over the wreck. These fish and crabs constantly mistook our hands for food and gave us nasty bites.

As long as we were raising large amounts of treasure and artifacts I had the happiest crew in the world, but when we had an occasional off day, each of my divers took it personally and bore a gloomy face. After the first two incredibly exciting days back on the wreck, we had a three day slump in which we found only 79 silver coins and very few other artifacts. The problem was not that we had uncovered a non-productive area of the wreck, but that we had found an area where the ballast rocks were about five feet deep and all of them — probably about 10 to 15 tons — had to be moved by hand to another area before we could continue the excavation since I insisted on doing it in a logical and complete manner. Moving huge ballast stones underwater is perhaps the most exhausting work in the world and caused us all to suffer aching backs in addition to our other sores and injuries.

The slump was followed by another two day frenzy during which we salvaged more than half a ton of silver in bars and large clumps of coins (in the shape of the original canvas bags which once held them); plus several thousand loose silver coins, a five pound gold disk, dozens of other silver items, many emeralds and amethysts, a large ivory elephant's tusk and scores of other valuable and interesting artifacts.

We were never without unwelcome visitors; barely a day went by that a plane didn't buzz low overhead or pirate vessels weren't on the horizon waiting for us to leave so that they could move in and steal some of the treasure. On several occasions we had problems with hungry sharks and barracudas. Usually we were able to chase them away by swimming toward them and shouting underwater but several times we had to resort to using powerful explosive spears to kill sharks.

We maintained our frantic pace and after a while became so accustomed to treasure that we didn't even consider a day especially good unless we had brought up more than $100,000 worth of finds. All of this time we had been working on the bow section of the wreck and according to the documents, the main bulk of the ship's treasure was stored in the main hull which had broken away and was lying in another area.

On October 6, by which day we had recovered more than an estimated $2,000,000 worth of treasure, I left the rest of my team hard at work on the bow and went in search of the rest of the wreck. In less than three hours I got a strong magnetometer reading and discovered the fluke of a large anchor protruding up through the sandy bottom. Then using a small metal detector I surveyed the area and discovered that I had miraculously found the rest of the *Maravilla*. Digging down only a few feet my hands clutched silver coins, all dated from the period of the wreck and my spirits soared: I had found the mother lode!

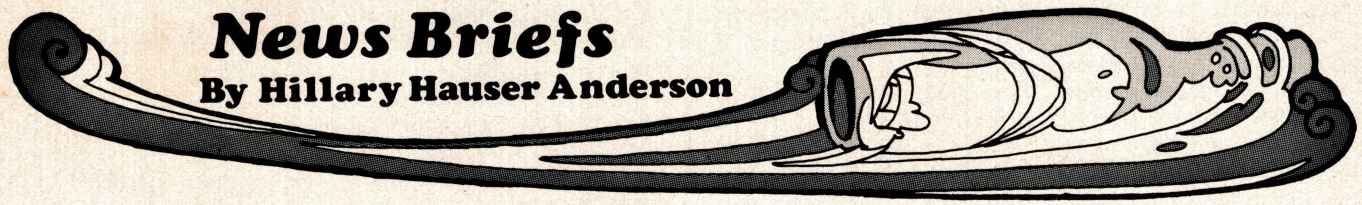
Returning to the *Grifon* with the intention of moving her to the new area, which was about two miles to the east, I found everyone waiting for me with very downcast countenances. Capt. Sherman had overheard a radio message from the commissioner of police in Nassau ordering a police launch to head for our area and bring us in. Realizing that we would have to leave at once or be arrested without explanation, I rushed back to where I had found the bulk of the wreck and cut loose the marking buoys I had tied over the site and dragged the anchor away with our small boat and dumped it in another area. I then went over the area once again with the magnetometer and got no readings: the ferrous anchor having given me the previous reading. Convinced I alone could find the site again, we left for port.

Bascom had stayed ashore after the first few days of working the wreck and had been dealing with the Bahamian government officials. All went well at first and he had received permission to have us keep all the treasure and artifacts in Florida banks until our division with the Bahamian government. However, the person he had been dealing directly with, Dr. Doris Johnson, was replaced as Minister of Transport and problems mounted as we were caught in an internecine government squabble.

The new Minister, Darrel Rolle, refused to honor most of the arrangements that Bascom had worked out with Dr. Johnson; the most serious one concerning our keeping the treasure and artifacts in Florida. On October 5, 1972, Bascom met with the Prime Minister of the Bahamas in what was a less than cordial meeting. The Prime Minister ordered Bascom to return all of the treasure to the Bahamas, which Bascom refused to do, and the Prime Minister then decided that the best means to get the treasure to Nassau, where it rightfully belonged, was to suspend the lease. *(Continued on Page 67)*

News Briefs

By Hillary Hauser Anderson



SEX TALK

Are divers chickens? That was a question asked on the nationally televised game show, Hollywood Squares (NB, Feb. '74). We checked with the producers of the show and found that according to a study by a team of psychiatrists, men who dive are "trying to prove their masculinity." You can read all about it in a book entitled *Sex Talk*, by Myron Brenton.

$75,000 DIVE

A 25 year old British diver made the plunge into the Thames last winter and came up with an artifact worth $75,000. What the diver found looked like nothing but a worthless piece of metal; what it turned out to be was a solid gold sword encrusted with 300 diamonds. British authorities think it may be the sword Lord Nelson was given after the 1798 Battle of the Nile.

U/W LAWNMOWER

Technicians at Penn. State U. have developed an underwater lawnmower to help combat the growing problem of aquatic weeds in the nation's lakes and waterways. In many areas the weeds have grown to a point where they are choking shallow lakes, creating swamps. Plant growth is attributed to the chemical and organic fertilizers that are dumped into waterways by farmers and new housing developments. The lawnmower has been termed "effective and inexpensive." It has paddlewheels that move it across the water. Two cutting bars crop the weeds to a depth of six feet, and the cuttings float into a basket mounted behind the bars.

THE SAN JOSE CAPER

At the beginning of this year, a news story broke that made national headlines. Florida treasure diver Tom Gurr had allegedly thrown back into the sea all of the treasure he had salvaged from the Spanish galleon *San José*. The *San José* was one of 21 ships in a fleet returning to Spain from the New World with treasure and other products, which was lost during a hurricane in 1733. Gurr discovered the wreck in 1968 off Plantation Key and began salvaging the site. Since the wreck was located outside the three-mile limit, Gurr felt that he did not need to get a salvage permit from the Board of Archives and History, a department of the State of Florida in charge of regulating shipwreck activities. When rumors began to circulate that Gurr was bringing up "millions," the state arrested Gurr for salvaging a wreck without a permit; Gurr finally accepted the state's jurisdiction and for the past five years had continued to bring up treasure.

Gurr had completed his salvage effort on the *San José* in August, 1973. In December, Gurr was notified that state representatives would pick up everything during the first week in January, 1974. (Why the state had not picked up any treasure or artifacts for two years is not explained.) This is when Gurr was shown by CBS news cameras throwing everything back into the sea. Gurr stated to the press that since the State of Florida had refused to give him a division during his five years of salvaging, he was bankrupt and was returning everything to where he had found it. Gurr was arrested and charged with grand larceny since the state maintained that he threw away state property. Gurr was portrayed by the press as something of a Robin Hood fighting against the tyranny of state bureaucrats in Tallahassee.

State divers searched the sea bottom but found no traces of the loot. Then, in a canal behind Gurr's home the state divers found some of the missing items, which were only a small number of coral encrusted artifacts of little monetary value.

State officials and a number of close associates of Gurr maintain that he did not throw anything of value into the sea, but only a small number of artifacts of little value — a charge that Gurr vehemently denies. The FBI was brought into the investigation after it was learned that a number of coins (valued at around $30,000) were scheduled to be auctioned in Los Angeles on February 6. Gurr claimed that these coins were salvaged before he was forced to get a state salvage permit, but state officials stated that even if this were true, Gurr was still in the wrong since he was supposed to turn over everything he had ever salvaged to the state, including all items he had recovered when he first worked on the wreck. The state subsequently seized the coins that were to be auctioned.

BAHAMAS ACT

The Bahamian government is drafting amendments to its Abandoned Wrecks Act of 1965, to protect future treasure finds. The action stems from the controversy which had developed over the *Maravilla* caper last summer (see page 54). In the reconciliation between the Bahamas and Seafinders, Seafinders will be allowed to continue salvage of the Spanish wreck, provided that a Bahamian government representative remain aboard the salvage vessel during the entire operation and that Seafinders obtain a bond for $10,000 to cover any government expenses which ought to be paid by Seafinders, this amount to be increased if subsequent expenditures warrant. All items salvaged will be turned over to a Bahamian representative at West End.

WHALE BOYCOTT

Because Japan and Russia have failed to adhere to whaling quotas set by the Intl. Whaling Commission last year, a national boycott of products from the two countries was organized by conservation groups on the East Coast. The Natl. Wildlife Federation, Washington, recently distributed free bumper stickers ("Stop the Whale Killers," "Boycott Japanese Goods," etc.). According to Ocean Science News, NWF is asking President Nixon to combine consumer action with "firm federal action" aimed at dissuading the Soviets and Japanese from increased whaling - i.e., by using bargaining leverage with the Soviets on wheat transactions. For boycott information, write: Save the Whales, Box 3650, Wash. D.C. 20007.

TITANIC ENTHUSIASTS MEET

Last fall the Titanic Enthusiasts of America gathered for a two day convention in Greenwich, Conn. Their banquet consisted of the same menu served to first class passengers on the night of the disaster. Seven survivors of the tragic sinking were at the convention with mementos of the ship. (In the sinking of the *Titanic* on April 15, 1912, 1500 persons died and 700 survived — mostly women and children. About 30 survivors still live.) There are about 300 Titanic Enthusiastics all over America; the group publishes a quarterly magazine called Titanic Commutator, and has entertained the idea of raising the world famous ship.

18 WRECKS FOUND

Dr. George Bass of the American Institute of Nautical Archaeology (NB, April) reports finding 18 ancient wrecks off Cyprus — dating from every period of antiquity: preclassical, Classical, Hellenistic, Roman, Byzantine, and later. All of the wrecks were found in 110 feet of water.

DIVERS' ANTABUSE

A drug used to treat alcoholism could possibly allow divers to breathe oxygen at depths to a greater extent than now possible. The drug, disulfiram, also known as Antabuse, seems to prevent oxygen toxicity in test animals and allows them to breathe more of it before adverse effects set in. Oxygen can reduce decompression time considerably after deep saturation dives. Inert gases, such as helium, which are contained in breathing gas mixtures, accumulate in body tissues and must be removed slowly for safe decompression. When oxygen is breathed, the inert gases are more rapidly replaced. However, oxygen has its own drawbacks if breathed at partial pressures greater than ½ ATMS for more than specified periods. Damage to the central nervous system or lungs, convulsions, edema or death can occur. In tests conducted by U. of Kansas researchers, animals injected with disulfiram before exposure to oxygen showed significant delays in times of onset of convulsions and lung damage. Further studies are underway to see how much protection the drug would provide to humans.

GOLD HAZARD

At the end of last year $2.5 million in gold bullion was recovered from a WW II wreck off Newfoundland. The bullion went down with the *Empire Manor* in 1944, 200 miles south of Newfoundland. The gold is believed to be the property of the British government. According to news sources we received from C. P. Hall, the vessel had been rammed by a sister ship on a convoy to Britain, and the bow section, in which the bullion was stored, was sunk by Royal Navy gunners, who believed they were removing a navigational hazard. The gold was recovered from under the mud at 330 feet by a salvage company.

ODDS & ENDS . . .

Sea otters face hypertension, circulatory ailments and reproductive damage because of toxic levels of oil, DDT, cadmium and hydraulic fluids along the Monterey, Calif. coastline, according to a marine biologist at Stanford U . . . A Natl. Oceanographic Institute is planned for Cabo Frio, Brazil, by the French Natl. Center for the Exploration of the Seas . . . New gear tested by tuna boats has "appreciably reduced porpoise kills," according to reports given at a workshop at the Southwest Fisheries Center. $150,000 tapered tuna seines are currently being tested . . . 165,000 used tires have been sunk off Ft. Lauderdale to expand the Osborne artificial reef . . . The schooner *Tiki,* once featured in a TV series is now a sea-going classroom for Queens College, N.Y. . . . Parasitic nematode infections of the ears may be the cause of mass whale strandings, it is theorized. Smithsonian scientists studied 52 dead whales who had beached themselves off So. Carolina last fall and found infections in 39 individuals. The infections may interfere with navigation.

1000 FOOT TESTS SHOW DIVERS CAN COMPRESS RAPIDLY

Just before Christmas of last year, four divers compressed to 1000 feet in only 33 minutes breathing a tri-mix (helium/oxygen/nitrogen). The 1000 foot test was conducted at Duke University, No. Carolina, under the direction of Dr. Peter B. Bennett. The divers — Eric Geerts (Oceaneering Intl.), Dr. David Youngblood, Jeff Prentice and Chris Swann (Harbor Branch Foundation) arrived at the simulated depth of 1000 feet with little of the usual loss of mental and physical capacity that afflicts divers breathing the traditional helium/oxygen mixture, and they returned to surface pressure in a little over 96 hours. This compares to the usual 14 day decompression period now used by the U.S. Navy for a similar dive to 1000 feet.

Nitrogen has not been used before in deep diving because of its narcotic effect at depths greater than 150 feet. But problems with helium/oxygen have limited the depths to which man can safely dive. Helium causes HPNS (High Pressure Nervous Syndrome) at depths of 500 feet or greater. HPNS is characterized by nausea, dizziness, tremors, lapses of consciousness. However, nitrogen negates the effects of HPNS, and the narcotic effects of nitrogen are relieved with increasing pressure.

The physiological reasons for this are explained by Bennett: Nitrogen under pressure is adsorbed on the cell membranes of the body, causing them to expand — producing a narcotic effect. Helium is *not* adsorbed and the pressure on the outside membranes causes constriction of the membranes, which brings on HPNS and other helium effects. With the right balance of gases, says Bennett, the hope is that the combination of expansion and compression will keep the cell membranes at their normal size and thus produce no effect on the divers.

During previous 720 foot dive tests (NB, Jan. '74), the nitrogen content of the breathing mix was 25 percent. The divers had no HPNS, but suffered slight narcosis. During the 1000 foot test, the nitrogen content was 18 percent. Bennett had planned to conduct another 1000 foot dive test this spring, with the nitrogen reduced to 12 percent. Data will be carefully correlated at Duke University and tables will be set up (there are presently very few tables on bounce dives). These tables will enable divers to reach greater depths more quickly without being incapacitated. The advantages for work in oil fields, where it costs $40,000-$50,000 a day for a drilling rig to operate, is obvious. Also, undersea rescue capabilities will be greater extended since divers will be able to descend to trapped subs much more quickly. On February 11, Duke University began another 18 month study on decompression in an attempt to devise a schedule in which a diver can compress to 450-600 feet, with 30 minutes on the bottom — and 10-11 hours decompression.

READERS ARE INVITED TO SEND ITEMS TO NEWS BRIEFS EDITOR HILLARY HAUSER ANDERSON, 8490 SUNSET BOULEVARD, LOS ANGELES, CALIFORNIA 90069

The Beaked Coralfish

(Chelmon rostratus)

Known to most divers as the cover star of Doug Faulkner's book *Hidden Sea,* the beaked coralfish is one of the most photogenic fishes of Australian reefs. Its brightly colored costume and willingness to be approached makes it an extremely popular fish with underwater photographers, divers and snorkelers alike. The fish is yellowish-white with four to five orange vertical bands, the first three rimmed in brown, the last in pale blue. Within the fourth band, on the soft dorsal fin, is a large black spot, edged in white. Across the base of the tail is a narrow black band. The soft dorsal, caudal and anal fins are edged with narrow blue and white intramarginal lines. ☐ The vertical bands, notably the one through the eye, and the large eye-like ocellus on the soft dorsal are characteristic of the butterflyfish family (Chaetodontidae), to which the beaked coralfish belongs. This is the fish's natural protective camouflage; predators that calculate the movement of the fish by the position of the eye often miss their target when they mistake the large black ocellus for the eye, the real one being camouflaged by the first vertical stripe. Another of the defense mechanisms of butterflyfish are the dorsal spines (on *Chelmon rostratus* the posterior dorsal spine is longest). When the fish is cornered it will lower its head and spread these sharp spines, and these often serve as an effective weapon against enemies. ☐ Almost all butterflyfishes have the elongated snout, which is handy in picking up tiny invertebrates from normally inaccessible cracks and crevices in the reef. This snout is actually a tubular rostrum, or beak, and this is the origin of the generic name *rostratus,* which comes from the Latin word meaning "beak." ☐ According to Roger Steene, an Australian diver/ichthyologist who is currently assembling a book on Australian butterfly and angelfishes, the beaked coralfish is generally found in pairs in water to 20 feet deep. The pairing off of these fish also seem to serve as protection. One fish will stop to feed while the other swims on, but will always rush to catch up with the other. Butterflyfishes have been known to stake out territories and have often been observed pushing against each other with their foreheads. It is not known whether this is an act of aggression, territorialism or a mating ritual. ☐ The beaked coralfish is an extremely common fish in Australian waters, notably along Queensland, and elsewhere in the Pacific in non-surge zones of heavy coral growth. Steene has found that some large specimens in northern Australia lose the third, fourth and fifth body bar as well as the ocellus. *Chelmon rostratus* could possibly be confused with *Chelmon mullerii,* a very close relative in Barrier Reef waters. *C. mullerii* is a similar fish except the snout is shorter and the vertical body bars are bronze. *Chelmon rostratus* grows to about nine inches. The juveniles are usually recognizable as to species. Occasionally the young are seen picking parasites off other fish, performing a valuable service as part-time cleaner fishes.

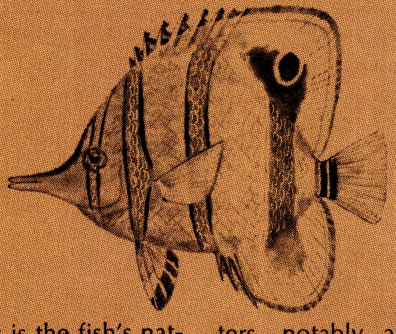
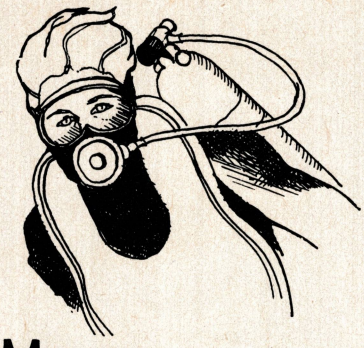


Photo By Carl Roessler–Text By Hillary Hauser Anderson

Photo taken in 45 feet of water at Marion Reef in the Coral Sea. Roessler used a Nikon F camera with a 55mm lens, a Bauer strobe, Kodachrome II, 1/60 at f11, 15 inches from subject.



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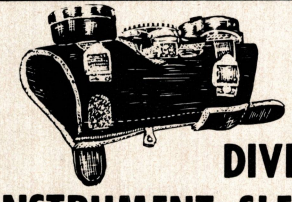
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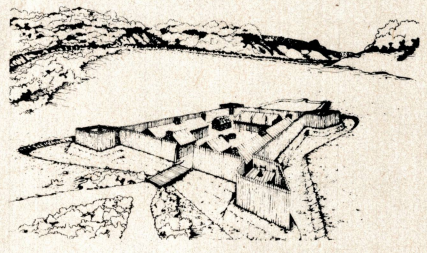
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FRESHWATER FINDINGS

Two University of South Carolina archaeologists have launched an underwater project in their state which they hope will reveal information vital to the future of marine archaeology. Alan B. Albright and John D. Combes have planned a sophisticated survey operation of a British colonial fort 120 feet beneath the surface of Lake Keowee, near Clemson, S.C. The effort will include experimental stations on the lake bottom and excavation work by university divers.

Combes, who is the assistant director of the university's Institute of Archaeology and Anthropology, found the fort in 1966. "It was called Fort Prince George and was built by the British in 1753. After various wars with the Indians and the French, the fort was abandoned in the 1760's. We finally found the site in the middle of a ploughed field after following a sketch map on a 200 year old land deed," said Combes. At the time the



An artist's rendering of Fort Prince George as it looked when built by the British in 1753. The fort now lays under 120 feet of water in Lake Keowee near Clemson, S.C. Archaeologists and divers will launch a vital study project on the Fort Prince George this spring.

Duke Power Company of Charlotte, N.C., was planning to fill the Keowee Valley for a combined nuclear and hydroelectric power plant. Aware of this, Combes conducted a two year excavation of the site. "When rising water forced us off the site in 1968, there was still a lot left to be done."

In June, 1973, Alan Albright was appointed the first official State Marine Archaeologist for South Carolina. It was then that Combes advanced the idea of an underwater operation on the Keowee site. "Fort Prince George has given us a unique opportunity," said Albright. "Knowing the previous condition of the site we can now use divers to reveal the effects of water and currents on the area. We can also continue excavation of the fort and in this way develop tech-

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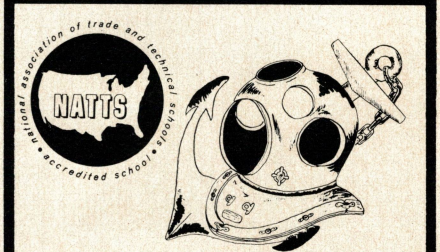
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niques that can be used elsewhere."

Albright has already made one exploratory dive on the fort and found the water extremely cold and visibility limited. This spring, he said, divers will place a collection of instruments, developed for the Keowee project by Marshall Williams of the University of Georgia's Physics Electronics Laboratory, on the fort. The instruments will be powered by a lakeside generator and will indicate current movement, oxygen content, sediment buildup and thermocline structure.

The data will be sent to Combes' office by broadcast or cable telemetry. "The information will be fed into computers here at the Institute and will give us a minute to minute report of conditions on the site," said Combes. Once the data is stored in this fashion it can be analyzed by the computer. Thereafter divers will be needed only for three monthly visual inspections of the site.

In a second phase of the operation, divers will descend to the lake bottom and excavate sections of the fort's moat left untouched in 1968. This will tell Albright and Combes how such work can be accomplished and what effect the water will have on surface features and artifacts.

There has been much speculation about the efforts of inundation of such sites since hydroelectric projects blossomed across the U.S. more than 25 years ago. Literally thousands of sites have been drowned. The wealth of information they contain was thought lost. The Keowee project may provide the key to open these flooded time capsules of America's past.

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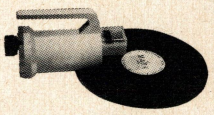
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MARAVILLA TREASURE

(Continued from Page 59)

After seven weeks, during which time we could not return to the wreck for fear of being arrested, Bascom finally agreed and reluctantly took all of the treasure and artifacts to Nassau. Expecting to have a division, I was naturally furious to learn that our salvage lease had been suspended and the division date postponed. Foolishly I accused the Bahamian Government of illegally seizing the wreck and treasure in the press, a move I was soon to regret.



Dave Edgell poses with the first gold coin found on the wreck site of the treasure laden Maravilla. *Three large silver bars weighing 80 pounds are stacked in the foreground.*

Unbeknown to me at the time, a number of other treasure hunters had gone to Nassau claiming to have discovered the wreck and there were also rumors around that we may not have returned all of the treasure. Consequently the Bahamians had to investigate these facts before permitting us to continue working the site or giving us our 75 percent share of the finds.

In February, 1973, Jack Kelley, a diving buddy from Tulsa, Oklahoma, replaced Bascom as president of Seafinders and immediately began trying to improve relations between our firm and the Bahamian government. Although it took a full year, Kelley was successful and our salvage lease has finally been reinstated and we expect to be back working the wreck by June of this year, weather permitting. All of the treasure and artifacts are currently undergoing preservation treatment, and when this is completed we will have our long awaited division.

Before the summer is over we hope to raise the rest of the *Maravilla's* treasure — including that solid gold statue of the Virgin — which has lain in a watery tomb for 325 years.

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Buoyancy Comp



In December, 1968, SKIN DIVER published its first report on a new, exotic personal flotation device from Europe called the Bouee Fenzy. Unlike its American CO_2 counterparts, this strange apparatus operated on compressed air, could be fully inflated at a depth of 100 feet or more, and was described as a buoyancy compensator. At the time, the concept of this revolutionary device was generally misunderstood by divers in this country.

Today, the buoyancy compensator is enthusiastically accepted by divers the world over, and it is heartily endorsed as a vital part of the pro diver's wardrobe. It has almost come out of the "accessory" class to be accepted by many as a piece of "basic" gear. This is born out by the fact that most of the major diving manufacturers have at least one model of BC listed in their 1974 diving equipment catalog.

In the past, personal flotation devices have been tagged with names such as life jacket, Mae West, safety float and scuba vest life jacket. Generically, all flotation systems that divers use can be grouped under the term personal flotation device. Specifically, a standard CO_2 vest is perhaps better known as an emergency flotation device — emergency meaning the vest is specifically designed to inflate by a one shot CO_2 cartridge in case of an emergency; flotation meaning the vest is designed to operate on the surface and not at depth. If these emergency flotation devices are used for what they are designed to do, they

ensator Roundup

THE YEAR OF THE UNDERWATER PARACHUTE

By Jack McKenney

generally work, providing the diver has attended to his vest with gentle care and maintenance.

A buoyancy compensator is an inflatable ballast tool which a diver may use both as a personal flotation device, operable at the surface and at depths to 200 feet or more, and as a system to control and trim a diver's buoyancy while underwater. Notice that the word emergency has been deleted, because buoyancy compensators can be used any time during a dive. A BC is a portable, flexible, air ballast system which operates much like the ballast system of a submarine. It is truly a unique tool for divers.

Buoyancy Control at Depth — When a wet suit clad diver descends to a depth below 33 feet, his suit begins to compress due to the water pressure, and he becomes heavier. He must then exert more physical effort to prevent sinking. However, by cracking just enough air into the BC, a diver can offset his sinking and once again attain neutral buoyancy. Upon ascending, the air can be removed by holding the corrugated tube above his head and depressing the mouthpiece valve, or by operating a dump valve.

Surface Use — After surfacing at the end of a dive, most divers hesitate to use their vest unless it's an emergency because it is too bothersome to blow the vest up orally, and too costly to expend a cartridge, and besides . . . it's only a 500 yard swim to the boat! By cracking air into a BC via the mini cylinder, or low pressure hose from the regulator, the vest will aid a diver in swimming and keeping afloat. He will arrive back at his base less fatigued. This can be done on every dive, regardless of how many dives are made in one day, providing there is an adequate air supply after each use. If the diver wants to descend again, he only has to deflate the vest and make his second dive.

One important point to remember is that a weight belt should be worn while floating at the surface, especially when wearing a full wet suit. This is important when the wearer might be unconscious, because a diver can only be certain of floating in a face up position if the lower limbs are weighted to act as a pendulum.

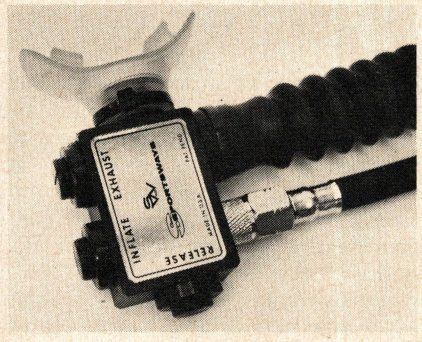
Emergency Breathing System — Another important factor that should be clearly understood is that during an emergency an air filled BC can be used as a breathing system. For example, if a diver is inside a cave or wreck and has run out of air, he can breathe from the bag by way of the oral inflation hose, and exhaling from his nose. This must be done carefully — and with a cool head — so that it doesn't offset the diver's buoyancy.

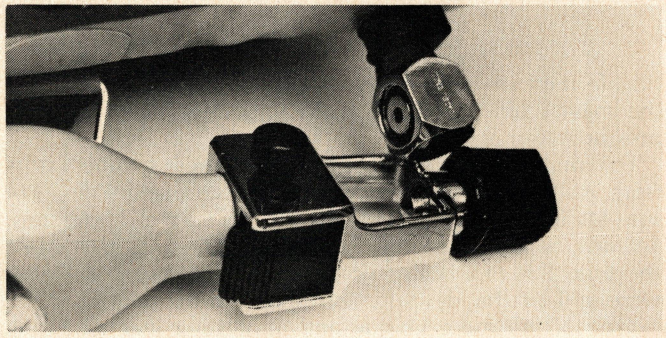
The emergency breathing technique should be thoroughly mastered in the shallow end of a pool before attempting it in the ocean. It's very important that this is not attempted if a CO_2 cartridge has been fired to inflate the vest during the dive. Breathing CO_2 would obviously end up with a diver blacking out and possibly drowning.

Buoyancy Ascent — The most impressive feature of a buoyancy compensator is its ability to fully inflate at depth — even at the 200 foot level. In the case of an extreme emergency, a diver can inflate a BC (in most cases in less than nine seconds) and make a rapid ascent to the surface. While a speedy ascent lessens the possibility of drowning by anoxia, it does increase the chances for an accidental air embolism or a case of the bends. The procedure for buoyant ascent should be understood but not practiced unless there's an extreme emergency.

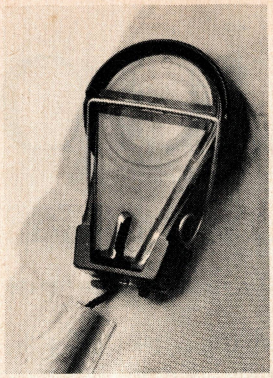
The U.S. Navy Diving Manual prescribes a normal, safe rate of ascent as 60 feet per minute. The old rule of thumb is: "Don't pass your own bubbles during ascent." This rate of ascent can be easily controlled with most BCs by carefully regulating the amount of compressed air put into the jacket. As soon as lift begins, the air supply is shut off. As the diver rises toward the surface, the air trapped inside the jacket will expand, thus providing more buoyancy and increasing the rate of ascent. The diver then "puts on the brakes" by venting off excess air through the oral inflator valve or dump valve.

As you can imagine, with a number of diving manufacturers now building these units, there are bound to be variations in design. However, by definition, the basic concept of a BC must remain the same, so SKIN DIVER established the following parameters to base this report on. 1) All buoyancy compensators must be able to support a fully clad diver in the 200 pound-plus range, at the surface with his head clear of the water. Each must fit over the head around the back of the neck, horse collar style. 2) All must be able to be orally inflated. 3) Each BC has to be mechanically inflatable, either by an attached re-





At right is a close-up of Sportsways' new combination oral and low pressure inflator for their BCs. Far right is the new push button air valve on Seamco/Nemrod's buoyancy compensators.



Above, the newly designed dump valve featured on the U.S. Divers and La Spirotechnique BCs.



COMPANY		
CATALOG NO.	8BC-1	1989
MECHANICAL INFLATOR	25 gram CO_2 cartridge	25 gram CO_2 cartridge
L.P. INFLATOR HOSE	yes (as an accessory)	yes
LIFT CAPACITY	38 pounds	42 pounds
COLOR	orange with black piping	yellow with black piping
WEIGHT OUT OF WATER	2 pounds plus	2 pounds, 14 ozs.
PRICE*	$99.95	$130.00

*Note: Unless otherwise noted, price includes cost of L.P. inflator hose if hose comes as an accessory

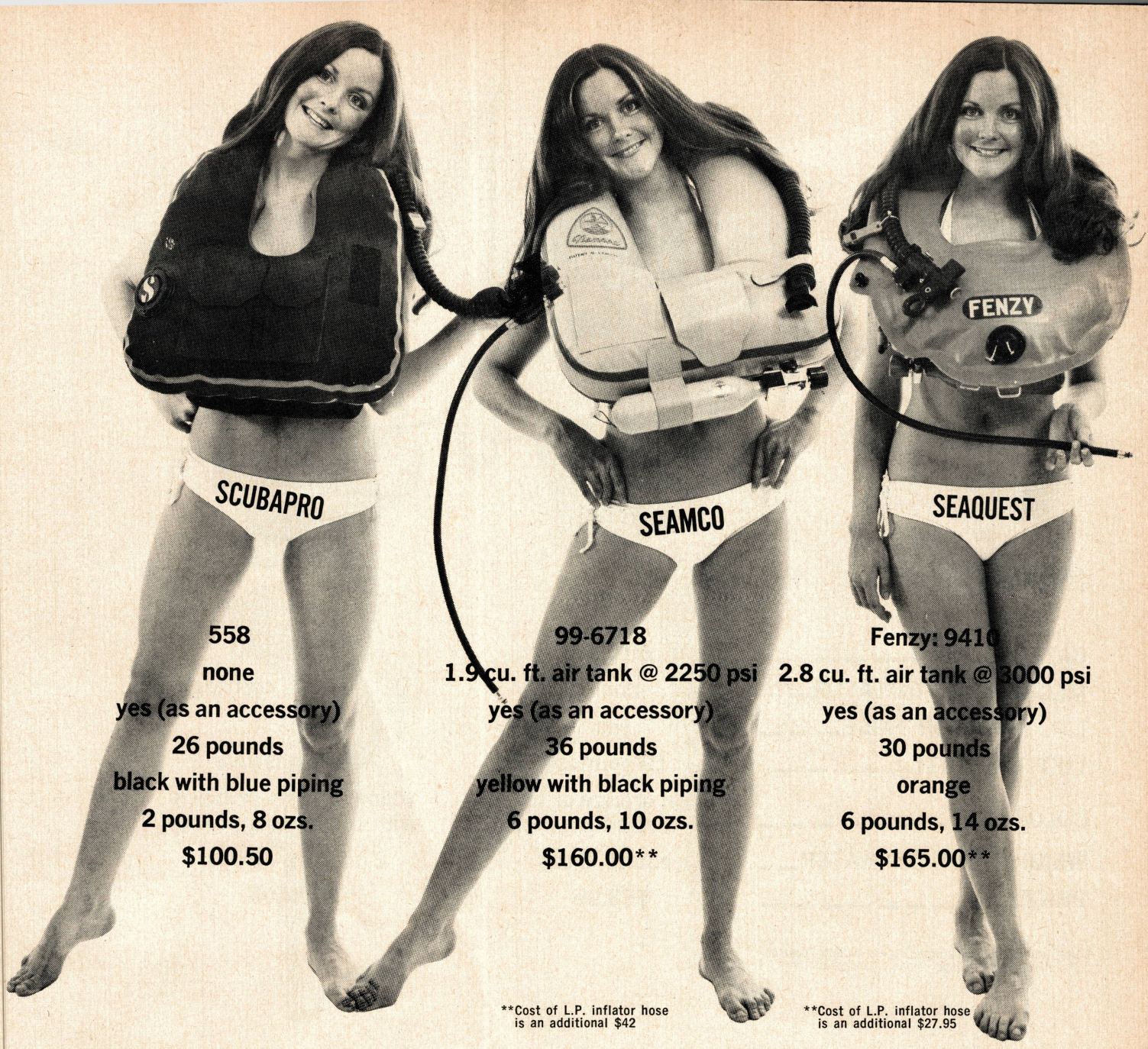
fillable mini air tank or by way of a low pressure hose off the main scuba system. 4) Each unit must have an over-pressurization valve.

For our report, we obtained buoyancy compensators from AMF Swimaster, Healthways, La Spirotechnique (114 rue Marius Aufan - 92306 Levallois, France), Scubapro, Seamco, Seaquest, Seatec, Sportsways, and U.S. Divers. At the time this report was prepared, White Stag and Dacor were still in the development stages with their BCs.

One of the more unique and interesting manufacturing innovations used on some of the BCs this year is the double bag construction. Healthways, U.S. Divers, Seatec and AMF Swimaster all feature a polyurethane thermo plastic bladder inside an outer nylon fabric bag, which is also urethane coated. All seams are electrically welded, making them as strong as the original material. Polyurethane is the most expensive plastic of its type and extensive tests have shown that this material, after being submerged in salt water for one year, showed no change in structural properties. The obvious advantage in this type of construction is that it is almost impossible to puncture this tough, flexible inner bladder because of the protection of the outer bag.

For many divers, size, weight and configuration is an important factor when choosing a piece of gear that is to be worn on the body. A buoyancy compensator should be no exception. Some divers, regardless of their physical size, prefer the largest vest they can get because it usually provides the greatest amount of lift. Others may be satisfied with the smallest profile BC to cut down on the drag while swimming underwater. Seamco/Nemrod is the longest in size measuring 26 inches long by 17½ inches wide. Seatec's is the smallest measuring 21 inches long by 16½ inches wide. U.S. Divers' BC, because of its three dimensional design, provides the greatest amount of lift at 53 pounds, and the Seatec BB-301 the least amount at 19 pounds. (These figures provided by the manufacturers.)

Let's expound on this for just a moment. A vest providing only ten pounds of lift would be more than adequate to lift a diver off the bottom and bring him to the surface. You know how exasperating it can be when you're just one or two pounds light while diving — it's darn difficult to stay on the bottom. Therefore, any of the BCs



SCUBAPRO	SEAMCO	SEAQUEST
558	99-6718	Fenzy: 9410
none	1.9 cu. ft. air tank @ 2250 psi	2.8 cu. ft. air tank @ 3000 psi
yes (as an accessory)	yes (as an accessory)	yes (as an accessory)
26 pounds	36 pounds	30 pounds
black with blue piping	yellow with black piping	orange
2 pounds, 8 ozs.	6 pounds, 10 ozs.	6 pounds, 14 ozs.
$100.50	$160.00**	$165.00**

**Cost of L.P. inflator hose is an additional $42

**Cost of L.P. inflator hose is an additional $27.95

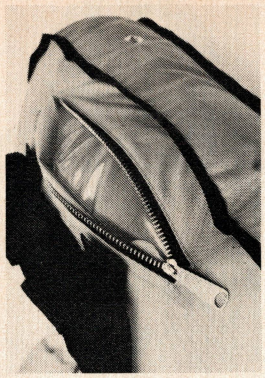
listed here are more than adequate to bring a diver to the surface. But on the surface more lift is required to keep a diver floating with his head out of the water.

As this is still the most important function of any type of personal flotation device, I personally tried out each BC in a pool with full gear on to determine its supportive capabilities. I wore a complete wet suit, single tank and regulator, 20 pound weight belt (I was a little heavy), mask and flippers. All of the BCs tested met SDM's standards. The small Seatec model BB-301 provided only marginal flotation with my face just barely out of the water while simulating unconsciousness. However, it must be remembered that this tiny vest only provides 19 pounds of lift. For a smaller and lighter person, or for diving in tropical water without a wet suit and therefore without a heavy weight belt, it should be more than adequate to keep a diver afloat with his face out of the water.

Those vests which fit closer to the head and those that consist of a larger diameter collar around the back of the neck, tended to keep the face higher up into the air. Those with the larger diameter collar are the Fenzy and La Spirotechnique. Those that fit very close around the neck are the Nemrod, U.S. Divers and Scubapro. Another interesting factor that most divers fail to take into consideration is the weight of a BC out of the water. Weight really isn't significant in the water, but if you'll be spending a fair amount of time dressed topside waiting to go in, it might be something to think about.

Seatec's model BB-301 and the Sportsways' BC are flat vests; all of the others feature some sort of a three dimensional, or expandable construction. Healthways, Swimaster, and the Seatec TD 1002-30 have a gusset in the lower one quarter portion of the vest, which expands upon being filled with air. The Fenzy and La Spirotechnique also have a flat profile, but expand to a greater diameter, especially around the back of the neck, than any of the others. U.S. Divers, Scubapro and the Seamco BC have a gusset around the entire perimeter of the vest. If you'd prefer to have a pocket on your vest to keep goodies in, Healthways, Scubapro, U.S. Divers, Swimaster, Sportsways, Seatec and Seamco can accommodate you.

The mechanical inflators are unique and varied this



Some of the BCs feature an inner bladder made of polyurethane thermo plastic, inside a nylon fabric bag.



COMPANY		
CATALOG NO.	BB-301	TD 1002-30
MECHANICAL INFLATOR	none	16 gram CO_2 cartridge
L.P. INFLATOR HOSE	yes	yes
LIFT CAPACITY	19 pounds	40 pounds plus
COLOR	yellow, orange or black with contrasting piping	yellow, orange or black with contrasting piping
WEIGHT OUT OF WATER	1 pound, 6 ozs.	2 pounds, 10 ozs.
PRICE*	$58.95	$110.00

*Note: Unless otherwise noted, price includes cost of L.P. inflator hose if hose comes as an accessory

year, with some really good designs. The low pressure inflators, which come off the first stage of the regulator, outnumber the self-contained bottle inflators seven to three. Seamco, Fenzy and La Spirotechnique feature high pressure mini bottles; however, of these three, both the Seamco and Fenzy BCs also accept a low pressure inflator hose, thus providing the diver with two mechanical methods of filling his BC.

Seamco's low pressure inflator can be inserted by the diver by cutting a tiny hole in the vest and inserting the inflator in any position he likes; or he can buy the Nemrod/Seamco Vest Inflator 99-6719 which fits into the same tank type fitting the bottle does, and use his BC strictly as a low pressure inflatable unit rather than as a high pressure bottle filled unit. By August of this year, U.S. Divers will also feature a buoyancy compensator model with a mini air tank.

Fenzy's new low pressure inflator, which retails for $27, is a separate assembly which fits into the existing mouthpiece on the oral inflation hose. As with Scubapro's and the new Sportsways' inflator, all units can be operated with one hand. There is a push button to admit air into the vest and a push button, which opens the valve allowing air to escape when the hose is held above the head.

All of the mini tank vests are filled off a regular scuba tank. A special filler adapter comes with the La Spirotechnique BC, while the Fenzy and Seamco models have a yoke attachment built into the bottle valve. Seamco has come up with a unique idea this year. Rather than having to twist the bottle as in their old style vest, or turning a valve as in other vests, the new 1974 model features a "push button." With a push of the thumb, the valve will open and air will be emitted into the vest.

A nice feature about Scubapro's, Sportsways', Swimaster's and Fenzy's method of filling the vest via the mouthpiece assembly is that all of the mouthpieces can be purged of water before putting the oral inflator into the mouth. Also, for convenience, it's handy to have both the mouthpiece and air inflation assembly built into one piece. The Fenzy low pressure inflator features a non-direction quick disconnect: one simply pulls back on the non-slip sleeve to engage or disengage. Sportsways is the



fastest to operate. Just by pressing a button the low pressure hose will separate. To attach, it simply pushes in and locks in place.

Three other BCs — the larger Seatec model, Seamco/Nemrod and Healthways — feature special mouthpieces that allow purging the water out before orally blowing air into the vest. This prevents water from accumulating inside the BC. Nemrod, Fenzy and La Spirotechnique all feature drain plugs with stoppers, with the Fenzy featuring a large 13/16 inch drain plug with a screw on cap.

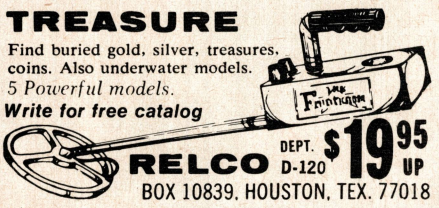
Inflatable Systems, Inc., the parent company of Seatec, has designed an inexpensive low pressure inflator mechanism which screws into a CO_2 cartridge holder. They have also a slightly more sophisticated low pressure inflator that operates like an air gun — just a press of the thumb will activate it. Swimaster, U.S. Divers, the Seatec model TD 1002-30, and Healthways, in addition to having a low pressure inflator, also have a CO_2 cartridge for emergency use on the surface.

All of the buoyancy compensators, except for U.S. Divers and La Spirotechnique, are emptied by holding the oral inflation tube over the head and pressing a valve. U.S. Divers and La Spirotechnique feature a new "dump" valve that empties the vest simply by pulling a cord. The valve is located near the highest part of the vest at the back of the neck so that all of the air can be released. U.S. Divers is offset to the right a few inches, so it would be necessary to roll slightly to the left to get rid of all the air completely.

In conclusion, SKIN DIVER would like to offer you these tips in selecting your personal buoyancy compensator: 1) Be your own judge. Don't limit your shopping to one or two models of BCs. Examine all of them before making your choice. 2) A buoyancy compensator is a tool which can be used as a ballast system at depth. Have your instructor show you the proper and safe methods for using one rather than experimenting on your own. 3) Lifting power is not the only criteria for choosing a BC design; workmanship and performance are all equally important factors in selecting a BC that fits you best. 4) Once you do purchase your buoyancy compensator, follow the manufacturer's guide for maintenance. The only good BC is one that operates flawlessly when you need it.

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DIVER'S LOG

(Continued from Page 13)

by another piece of gear. Given a choice between making the family car payments or a new regulator, the old regulator will probably have to do another year. "Good enough for now" equipment can become a real millstone around a diver's neck. Many divers are held back from the kinds of diving they would naturally get into because of short sighted purchasing.

The last of the equipping myths is fortunately disappearing; the brute force approach to being in the water which stresses the physical aspects of diving so much that the diver begins to believe that he is diving in spite of his equipment, not with it. This approach tends to cause the condition it is supposed to overcome. The diver, believing the quality of his equipment is secondary, selects less than adequate gear. The equipment, even though functioning perfectly within its limits, turns a safe situation into a marginal one. The diver then has to exert himself to overcome problems he encounters, in effect creating the condition he prides himself in being able to resolve.

Accident studies are beginning to show that most problems originate with the diver. In a realistic emergency the diver is more likely to have to rely on his gear as he could be too incapacitated to muscle his way out. A good example might be the diver who buys an inadequate life jacket because he's a good swimmer. He can't use the vest to stay neutral because it doesn't have an overpressure relief and it won't give adequate lift if he has to float on the surface. A stomach cramp and a mild surface chop, and what could have been an easily resolved problem is now a tragedy.

If you are just beginning to set up your rig, or if you are about to modify your existing set up, here are some points which most diving retailers would agree will give you the best service from your gear. 1) Select your equipment as though you weren't going to replace it. You probably won't. 2) Ask questions and make comparisons. Find out why two pieces of equipment doing the same job are designed differently. 3) Assume that your skills, ability and confidence will grow and allow for that growth. "Good enough for now" gear may not be good enough for later. 4) Take your time. If you rush into things you may get considerably less than you wanted.

Properly equipped, your diving season is potentially 12 months a year anywhere. Common sense and a little bit of logic will go a long way toward giving you that capability.



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May 3, 10, 17, 24, 31—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
May 5—ROATAN—7 days, Underwater Explorers Society, Pompano Beach, Florida.
May 11—NASSAU—7 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
May 11 — HONDURAS — 7 days, Sports World, Inc., San Marino, Ca.
May 12—GRAND CAYMAN—9 days, Photomarine Int'l Travel, Reseda, Calif.
May 14—ROATAN/HONDURAS—17 days, Chalet Club, New York, N.Y.
May 17—COZUMEL/YUCATAN — 7-12 days, See & Sea, Inc., San Francisco, California.
May 17—SPANISH HONDURAS—4 days, Grand Am Int'l Tours, Ocala, Fla.
May 18 — GREEK ISLANDS — 17 days, Emery Travel Service, Bradford, Pa.
May 18—GRAND CAYMAN—7 days, Skin Diving School, Bronx, N.Y.
May 18 — HONDURAS — 7 days, Michigan U/W Schools of Diving, Lincoln Park, Mich.
May 19—BONAIRE/CURACAO — 10 days, Rick Tegeler, See & Sea, San Francisco, Calif.
May 19 — COZUMEL — 7 days, Go Mexico, Inc., Minneapolis, Minn.
May 20—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
May 23—HONDURAS—7 days, Kathy Taylor, Island Reef Safaris, Wilton, Conn.
May 24—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
May 24 — COZUMEL/CHINCHORRO REEF — 11 days, Sunland Int'l Tours, Beverly Hills, Ca.
May 25—CAYMAN ISLANDS — 8 days, See & Sea, Inc., San Francisco, California.
May 25 — HONDURAS — 7 days, San Diego Divers Supply, San Diego, Calif.
June 1 — HONDURAS — 7 days, Divers Corner, Downey, Calif.
June 7, 14, 21, 28—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
June 7—BONAIRE/CURACAO—9 days, Loyal Travel, Inc., San Antonio, Texas.
June 8—SPANISH HONDURAS—6 days, Grand Am Int'l Tours, Ocala, Fla.
June 8—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
June 8, 15 — HONDURAS — 7 days, Cap'n Frogs Swim & Dive Shop, Roseburg, Ore.
June 10—HAWAII/KONA—8 days, See & Sea Travel, San Francisco, Calif.
June 11—HAWAII/KONA—8 days, Photomarine Int'l Travel, Reseda, Calif.
June 11 & 25—TRUK/PONAPE—11 days, Innerspace Adventures, Hickam, Hawaii.
June 13—VIRGIN ISLANDS—12 days, Sierra Club. San Francisco, Calif., Trip #382.
June 14—RIO DE JANEIRO, BRAZIL—14 days, Sunland Int'l Tours, Beverly Hills, Calif.
June 14—COZUMEL/YUCATAN — 7-12 days, See & Sea, San Francisco, California.
June 15—CAYMAN BRAC—8 days, Lee Turcotte, Atlantis Safaris, Miami Shores, Fla.
June 15—BRITISH HONDURAS—8 days, Lee Turcotte, Atlantis Safaris, Miami Shores, Fla.
June 15 — TRUK/PALAU — 15 days, Atlantis Safaris, Miami Shores, Fla.
June 16—AKUMAL—7 days, Underwater Explorers Society, Pompano Beach, Florida.
June 16—COZUMEL—7 days, Chalet Club, New York, New York
June 17 — AKUMAL — 10 days, Photomarine Int'l Travel, Reseda, Calif.
June 17—SEA OF CORTEZ—11 days, Sierra Club, San Francisco, Calif., Trip #337.
June 19—BIMINI—10 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
June 22—CAYMAN ISLANDS — 8 days, Dewey Bergman, See & Sea, San Francisco, Ca.
June 22—CAYMAN BRAC—8 days, Lee Turcotte, Atlantis Safaris, Miami Shores, Fla.
June 22—BONAIRE/CURACAO—9 days, Lee Turcotte, Atlantis Safaris, Miami Shores, Fla.
June 22 — COZUMEL — 7 days, Skin Diving School, Bronx, N.Y.
June 22 — HONDURAS — 7 days, Tackle Shack, Pinellas Park, Fla.
June 23 — COZUMEL — 7 days, Go Mexico, Inc., Minneapolis, Minn.
June 24—GRAND CAYMAN—10 days, Sierra Club Outings, San Francisco, Calif.
June 24—PANAMA/SAN BLAS—10 days, Photomarine Int'l Travel, Reseda, Calif.
June 26—GALAPAGOS ISLANDS — 18 days, Dewey Bergman, See & Sea, San Francisco, Ca.
June 28 — COZUMEL/AKUMAL — 8 days, Sunland Int'l Tours, Beverly Hills, Calif.
June 29—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
June 29 — HONDURAS — Neptune Dive & Ski, Inc., North Augusta, S.C.
July 3 & 15—NASSAU—7 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
July 4—MAUI & LANAI, HAWAII—11 days, Sierra Club, San Francisco, Calif., Trip #312.
July 5, 12, 19, 26—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
July 6—GRAND CAYMAN—11 days, Sierra Club Outings, San Francisco, Calif.
July 6—BONAIRE/CURACAO—9 days, John Kelley, See & Sea Travel, San Francisco, Calif.
July 6—BONAIRE/CURACAO—9 days, Lee Turcotte, Atlantis Safaris, Miami Shores, Fla.
July 6—NOVA SCOTIA—7 days, Chalet Club, New York, New York
July 6—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
July 6 — HONDURAS — 7 days, Michigan U/W Schools of Diving, Lincoln Park, Mich.

(Continued on Page 84)

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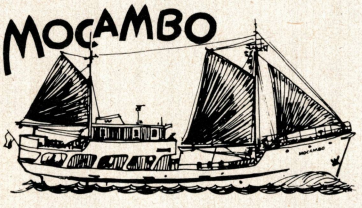
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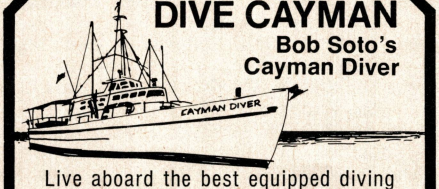
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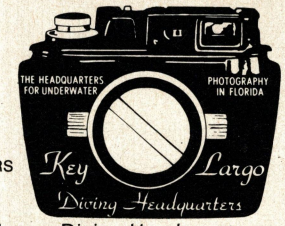
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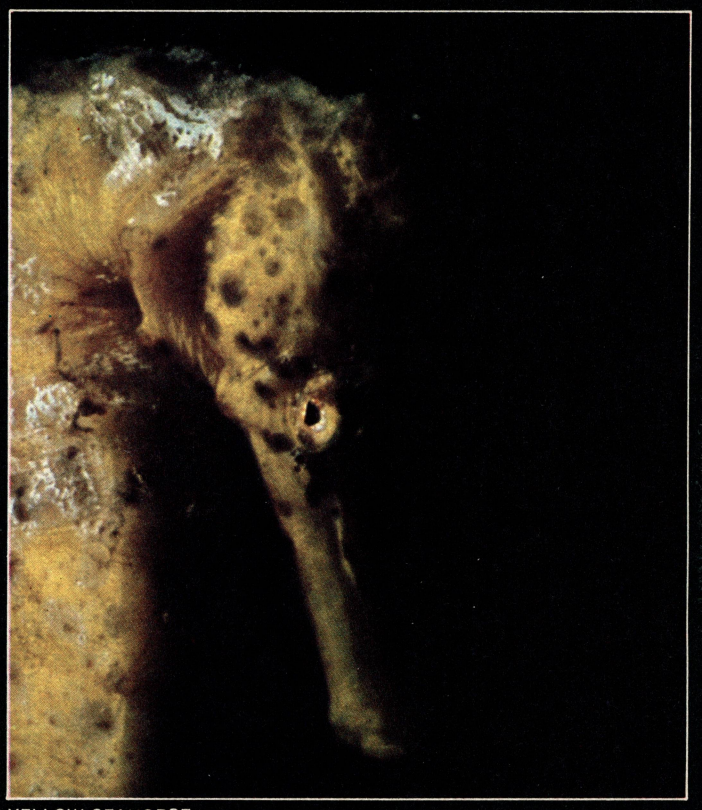
BONAIRE NIGHTLIFE

By Paul J. Tzimoulis

In Bonaire, sundown is that special part of the day which tends to separate the tourists from the really dedicated divers. While the tourists are showering and dressing for a big evening in town, the divers are most likely rearranging their dive gear, checking out dive lights, and fixing up underwater flash units. They eat a light dinner and abstain from any serious drinking, for the best part of their day is yet to come.

A night dive in Bonaire is one of the most unforgettable experiences a diver could ever hope for. It is a time of special adventure — a journey into darkness filled with exotic creatures and fascinating rituals. The reef's ecosystem turns upside down and weird looking creatures begin to appear — many of them never seen during daylight hours. There are high voltage action, mystery, and thrills not to be missed. For some, the night excursions become the trip's high point.

Perhaps the most appealing thing about night diving in Bonaire is that it's just as easy as daytime excursions. The best spot for this activity is the sloping coral reef which lies directly in front of the Hotel Bonaire, barely fifty feet away from the Aquaventure dive shop. The convenience of easy checkout of rental tanks and dressing up under the bright lights of the shop makes it far more inviting than fumbling around in the pitch black of a rocking boat. It is virtually impossible to get lost since you simply follow the slope of the reef from the hotel beach to its termination on a flat sandy bottom at 100 feet. The slant of the reef indicates your direction — up is toward shore, down is away from shore. If you have to surface in deep water, the lights of the hotel and dive shop serve as a guiding beacon, and the beach is seldom more than 50 yards away. And Aquaventure Director, Don Stewart, is always on hand to serve as underwater guide for night excursions. By going with him you have a better chance of seeing more of the exotic creatures and less chance of tangling with such "no-touch-ems" as scorpion fish or sea wasp jellyfish.



YELLOW SEAHORSE



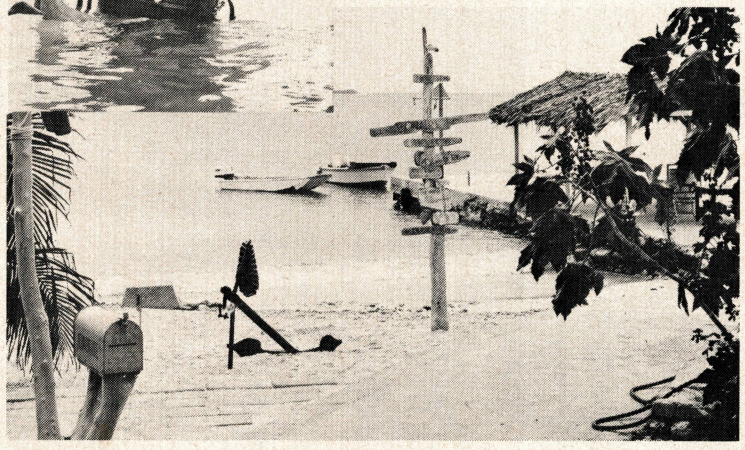
SPOTTED MORAY EEL

BONAIRE NIGHTLIFE





The coral reef directly in front of the Hotel Bonaire offers surprisingly good diving opportunities both day and night. This rapidly sloping reef is covered with a lush growth of marine life, which in turn attracts many exotic forms of sea creatures. Don Stewart, director of the adjacent Aquaventure dive shop, offers regularly scheduled night dives to qualified divers.





Let's go on a typical Bonaire night dive, and I will recount some of the sights you might encounter on just a single tank of air . . .

We begin suiting up for the dive around 10 or 10:30 p.m. — allowing sufficient time for the nocturnal creatures to awaken from their daytime slumber. We bring along two hand lights. It's smart to have a spare in case your main light should exhaust its batteries or burn out a bulb in the middle of the dive. If you're a photographer, you tape one of the lights to your underwater flash arm so you can illuminate the subject you're going to photograph.

We wade out into the dark Caribbean Sea directly from the beach, right between the pier and the swimming raft. Aside from the other divers, the beach is deserted and the water is flat calm. There is a peculiar stillness, much like walking through a western ghost town.

But by the time we reach waist deep water and flick on our underwater lights, the sea comes alive with activity. Thousands of tiny creatures zip back and forth through our light beams. There are shrimp larva, mini flat worms, and plankton of every description flitting about. We swing our lights to the left and their piercing beams reveal a living, undulating carpet of brilliant yellow-orange polyps fastened to the submerged portion of the boat pier. This bright burst of color is just a prelude to what lies in store for us in deeper water. We make a mental note of the polyp colony for shallow water macrophotography at the end of our dive.

We follow the sand bottom of the swimming area out to where it ends at the lip of the 45 degree angle slope. Water depth is 20 feet and the visibility has increased to approximately 80 feet. A colony of peculiar brown anemones poke their waving tentacles up through the loose sand bottom. It's odd to see them here because most anemones like to fasten themselves to hard coral heads, up off the bottom. Yet this particular species seems to thrive in the sand and must remain hidden under the surface during the daytime as we have never observed them before.

We encounter a few small, isolated clumps of coral at the 25 foot depth. They're covered with the normal varieties of sponges, hydroids, brittle stars, and other reef residents. But on closer examination, we discover anoth-

er oddball variety of anemone. Tucked close to the underside of the coral heads are several exceptionally beautiful specimens with translucent jelly-type tentacles and brilliant orange tips. In twenty years of diving, I have never before observed an anemone with such striking markings.

At a depth of 40 feet we arrive at the main portion of the reef, a veritable garden filled with sea fans, gorgonian plumes, colorful sponges, and corals of every size and description. Many of the larger formations are recognizable from our daytime explorations of this same area. Familiar sights like this are comforting as you swim through the darkness. Black and brown crinoids have already moved up to the highest corals, and fans stretch their feathery arms for food.

The clouds of schooling fish are gone, and many of the reef's inhabitants now lie sleeping in coral crevices or other protective niches in the reef. These sleeping fish appear to be in a stupor, drifting slowly among the corals and occasionally bumping into a sponge or fan. Our lights seem to confuse and mesmerize them further, and we are able to get very close to these creatures — even handle a few of them. For the underwater photographer, it is a boon, for he is able to obtain good close-up portraits of fish which are otherwise impossible to approach during the daylight hours.

We snap a full frame shot of a black and white banded jackknife fish, a shy little fish which is rarely seen in the open during the day. Next is a bright red squirrelfish which has bedded down in a small cup sponge . . . a priceless picture to say the least! Then we find a long skinny trumpetfish standing on top of a big black long-spined sea urchin. Out of sheer instinct and habit, this odd creature is attempting to camouflage its presence by pretending to be another spine of the urchin. Next it is a pink goatfish with a bright yellow tail . . . then a clownish looking trunkfish with puckered lips and a triangular shaped body . . . and finally a splendid queen angelfish with iridescent yellow and blue markings. In a brief fifteen minutes we must have encountered more than fifty different fish, all willing to pose for the camera.

Our most ticklish encounter is with a ferocious looking spotted scorpionfish lying on a small patch of sand in 35 feet of water. He is a lumpy looking creature covered with frilly warts and a wide lipped mouth. His coloration is sort of a sandy mottled brown with flecks of orange and white mixed into a camouflage pattern which enable this creature to blend into the bottom perfectly. Only his black beady eyes serve to indicate this ignominious lump is actually a living creature. He is so ugly that he appears beautiful in an odd sort of way. We are careful not to get too close to the scorpionfish or accidently bump it with a clumsy hand or elbow movement, for this creature carries a powerful poison in its needle-sharp dorsal spines. A simple puncture wound from this mini-monster can cause a diver excruciating pain and hospitalization.



Sundown in Bonaire is the bewitching hour when divers transform into adventurers of the darkness.

Further on we come upon still another eerie apparition. Perched atop a tall coral head is a gargoylish looking creature of a hundred tentacles, spread out in a pattern similar to a large radar antenna. It hasn't been there during the day so obviously it has crawled up on the coral from some deep dark hole. A little closer examination reveals it to be a basket starfish, one of the weirdest creatures of the night. Don Stewart indicated that five such animals live on this reef and can be seen regularly almost any night of the year.

Toward the end of the dive we notice a small black and white spotted moray eel swimming free across the reef. Normally a timid creature who hides under rocks, the moray comes out of his lair at night to hunt food. We follow the creature at a safe distance as he snakes his way between the corals, heading toward some mysterious rendezvous. Then he does a very strange thing. Upon encountering a clump of large purple tube sponges, the eel abruptly stops and backs down one of the long hollow tubes. Hidden by the sponge, all that is visible is the snout and eye of the eel. He remains very still, waiting for some unsuspecting fish to pass within close enough range for a sudden, deadly strike. We are absolutely dumbfounded by the eel's actions, as we never imagined a moray to have the clever intelligence to set up an ambush! We later learn the same eel is often found hiding in this same tube sponge night after night, thus proving the ambush setup is a regular part of his hunting.

Now it is time to begin the return journey to the beach, for our tank pressure gauges indicate only 500 psi left. It is on this return leg of the swim that we encounter our most delightful surprise of the evening. In less than 30 feet of water, next to the anchor block for the swimming raft, we find a handsome yellow sea horse. He is clinging to an old frayed piece of anchor rope, close to the bottom. He measures close to seven inches in length, a fairly large specimen for the species. Although a rather timid creature by nature, this particular sea horse very graciously poses for close-up photos. His odd method of swimming and clever use of his tail become a source of fascination.

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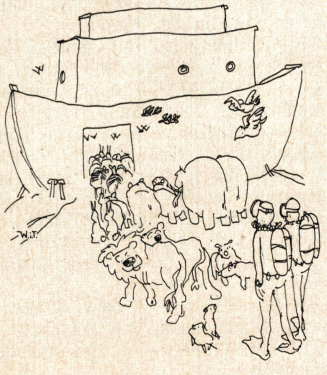
Rick Frehsee, professional photo-journalist and SKIN DIVER author, will teach two courses in underwater photography this summer at Anthony's Key Resort, Roatan, Honduras. The first course is from June 30 to July 6, and the second is from July 7 to 13. The $275 fee pays for the photo course, full meals and accommodations, diving equipment, boats, air and guides.

Rick's photo-stories have appeared in many major books and publications, and his course in underwater photo-



graphy has been developed over a two year period at the Marine Science Technology Department at Miami Dade Community College. The course at Roatan includes all day diving and photography on the spectacular reefs, drop-offs, caves and coral formations of the Bay Islands, Honduras, while learning underwater photography in the early mornings and evenings. Subjects included are: the physics of light, camera theory, lens optics, available and artificial lighting, equipment selection, macro-photography and creative U/W photography.

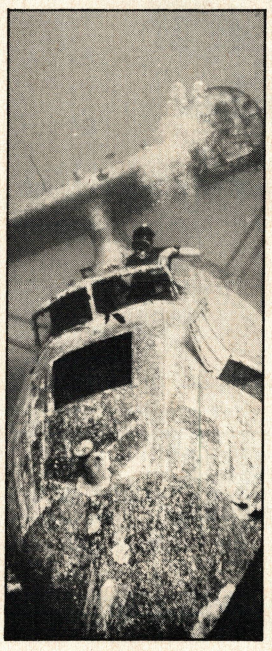
Nikonos cameras, flashes and many other photo accessories are available for rental to students on a reserved basis. Also available is black and white developing and E-4 Ektachrome processing kits. For reservations and information contact: Kathy Taylor's Island Reef Safaris, 34 Ground Pine Road, Wilton, Conn. 06897. Telephone (203) 762-0497.



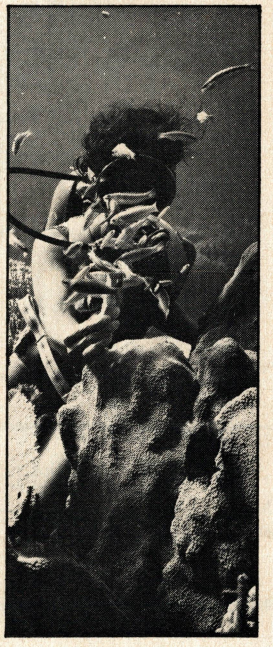
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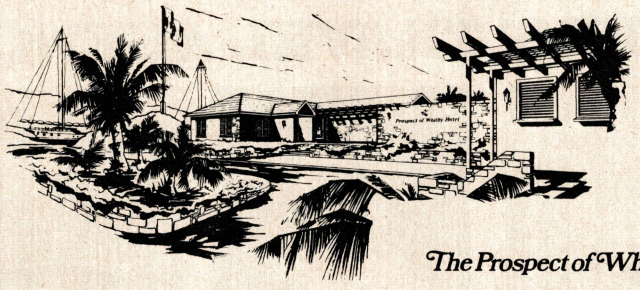
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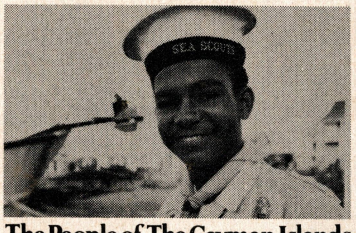
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Dive Tour News

(Continued from Page 75)

July 7—ROATAN/HONDURAS—7 days, Kathy Taylor, Island Reef Safaris, Wilton, Conn.
July 12—SPANISH HONDURAS—4 days, Grand Am Int'l Tours, Ocala, Fla.
July 13—ANDROS, BAHAMAS—7 days, Underwater Safaris, Boston, Mass.
July 13—COZUMEL/YUCATAN—8 days, Anchor Shack, See & Sea Travel, San Francisco.
July 13 — HONDURAS — 7 days, Ski & Dive, Inc., Alexandria, Va.
July 14—ROATAN/HONDURAS—7 days, Kathy Taylor, Island Reef Safaris, Wilton, Conn.
July 14—CAYMAN BRAC—7 days, U/W Explorers Society, Pompano Beach, Florida.
July 16—GALAPAGOS—23 days, Sierra Club, San Francisco, Calif. Trip #340.
July 18—MAUI & LANAI, HAWAII—11 days, Sierra Club, San Francisco, Calif., Trip #313.
July 20—CAYMAN ISLANDS—8 days, Bernie Campoli, See & Sea Travel, San Francisco.
July 20 — BRITISH HONDURAS — 8 days, Sunland Int'l Tours, Beverly Hills, Calif.
July 21 — COZUMEL — 7 days, Go Mexico, Inc., Minneapolis, Minn.
July 23 — TRUK/PONAPE—11 days, Innerspace Adventures, Hickam, Hawaii.
July 27—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
July 27 — HONDURAS — 7 days, Aquaspace, Huntsville, Ala.
July 28—TAHITI/RANGIROA—9 days, Photomarine Int'l Travel, Reseda, Calif.
Aug. 2—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
Aug. 2, 30—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
Aug. 2, 9, 16, 23, 30—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
Aug. 3—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
Aug. 3 — HONDURAS — 7 days, Colorado Divers World, Denver, Colo.
Aug. 10—SPANISH HONDURAS—6 days, Grand Am Int'l Tours, Ocala, Fla.
Aug. 10 — HONDURAS — 7 days, Diving Locker, San Diego/Scubaffair, Laguna Niguel.
Aug. 12—BIMINI—10 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
Aug. 17—CAYMAN ISLANDS—8 days, John Reseck, See & Sea Travel, San Francisco, Calif.
Aug. 17—BONAIRE/CURACAO—9 days, Peter Capen, See & Sea Travel, San Francisco, Calif.
Aug. 17 — HONDURAS — 7 days, Cougar Sports, Inc., Bronx, N.Y.
Aug. 18—AKUMAL—7 days, U/W Explorers Society, Pompano Beach, Florida.
Aug. 19—AMERICAN & WEST SAMOA—15 days, Sierra Club, San Francisco, Calif., Trip #356.
Aug. 19—PANAMA/SAN BLAS—10 days, Photomarine Int'l Travel, Reseda, Calif.
Aug. 20—TRUK/PONAPE—11 days, Innerspace Adventures, Hickam, Hawaii.
Aug. 24—COZUMEL/YUCATAN—8 days, Gene Foster, See & Sea Travel, San Francisco, Calif.
Aug. 24—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
Aug. 24 — HONDURAS — 7 days, Underwater Schools of America, Fountain Valley, Ca.
Aug. 26—NASSAU—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
Aug. 30—COZUMEL/CHINCHORRO REEF—11 days Sunland Int'l Tours, Beverly Hills, Calif.
Aug. 30—PUERTO RICO—4 days, Chalet Club, New York, New York
Aug. 31—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
Aug. 31 — HONDURAS — 7 days, Aquatics, Ltd., Nashville, Tenn.

Sept. 2—MARISLA/SEA OF CORTEZ—7 days, Photomarine Int'l Travel, Reseda, Calif.
Sept. 6—NASSAU—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
Sept. 6, 13, 20, 27—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
Sept. 6—GREEK ISLANDS—17 days, Lee Turcotte, Atlantis Safaris, Miami Shores, Fla.
Sept. 7—CAYMAN ISLANDS—13 days, Dewey Bergman, See & See Travel, San Francisco.
Sept. 7—BONAIRE/CURACAO—9 days, Carl Roessler, See & Sea Travel, San Francisco.
Sept. 7 — HONDURAS — 7 days, Boca Marine, Inc., Boca Raton, Fla.
Sept. 9—HAWAII/KONA—8 days, See & Sea Travel, San Francisco, Calif.
Sept. 13—RIO DE JANEIRO, BRAZIL—14 days, Sunland Int'l Tours, Beverly Hills, Calif.
Sept. 13—SPANISH HONDURAS—4 days, Grand Am Int'l Tours, Ocala, Fla.
Sept. 14 — HONDURAS — 7 days, Aquatic Center, Key West, Fla.
Sept. 21 — HONDURAS — 7 days, Atlantis Diving Center, Philadelphia, Pa.
Sept. 27—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
Sept. 28 — HONDURAS—7 days, Michigan U/W Schools of Diving, Lincoln Park, Mich.
Oct. 4—MARISLA/SEA OF CORTEZ—7 days, Photomarine Int'l Travel, Reseda, Calif.
Oct. 4, 11, 18, 25—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
Oct. 5—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
Oct. 5 — HONDURAS — 7 days, USAFECO, Salt Lake City, Utah
Oct. 7—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
Oct. 11—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
Oct. 12—SPANISH HONDURAS—6 days, Grand Am Int'l Tours, Ocala, Fla.
Oct. 12—COZUMEL/YUCATAN—8 days, Van Worley, See & Sea Travel, San Francisco, Calif.
Oct. 12—BONAIRE/CURACAO—9 days, See & Sea Travel, San Francisco, Calif.
Oct. 12—ROATAN/HONDURAS—6 days, Chalet Club, New York, N.Y.
Oct. 12—GRENADINES—7 days, Windward Leeward Sailing Tours, San Francisco, Calif.
Oct. 12 — HONDURAS — 7 days, Underwater Schools of America, Fountain Valley, Ca.
Oct. 19—CAYMAN ISLANDS—8 days, Rich Bergero, See & Sea Travel, San Francisco, Calif.
Oct. 22—AUSTRALIA/CORAL SEA—17 days, Bob Hollis, See & Sea Travel, San Francisco.
Oct. 22—TRUK/PONAPE—11 days, Innerspace Adventures, Hickam, Hawaii.
Oct. 26—AFRICA/INDIAN OCEAN—23 days, See & Sea Travel, San Francisco, Calif.
Oct. 26 — HONDURAS — 7 days, Houston Scuba Academy-West, Houston, Texas
Oct. 27—TAHITI/RANGIROA—9 days, Photomarine Int'l Travel, Reseda, Calif.
Nov. 1—ISRAEL/RED SEA—21 days, Lee Turcotte, Atlantis Safaris, Miami Shores, Fla.
Nov. 1, 8, 15, 22, 29—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
Nov. 2—CAYMAN ISLANDS—8 days, See & Sea Travel, San Francisco, Calif.
Nov. 10—SPANISH HONDURAS—4 days, Grand Am Int'l Tours, Ocala, Fla.
Nov. 11—HAWAII/KONA—8 days, See & Sea Travel, San Francisco, Calif.
Nov. 13—MICRONESIA—17 days, Chalet Club, New York, N.Y.
Nov. 22—COZUMEL/AKUMAL—8 days, Chalet Club, New York, N.Y.
Nov. 22—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
Nov. 23—COZUMEL/YUCATAN—8 days, Ron Merker, See & Sea Travel, San Francisco, Calif.
Nov. 27—HAWAII/KONA—8 days, Photomarine Int'l Travel, Reseda, Calif.
Nov. 30—CAYMAN ISLANDS—8 days, See & Sea Travel, San Francisco, Calif.
Dec. 6, 13, 20, 27—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.

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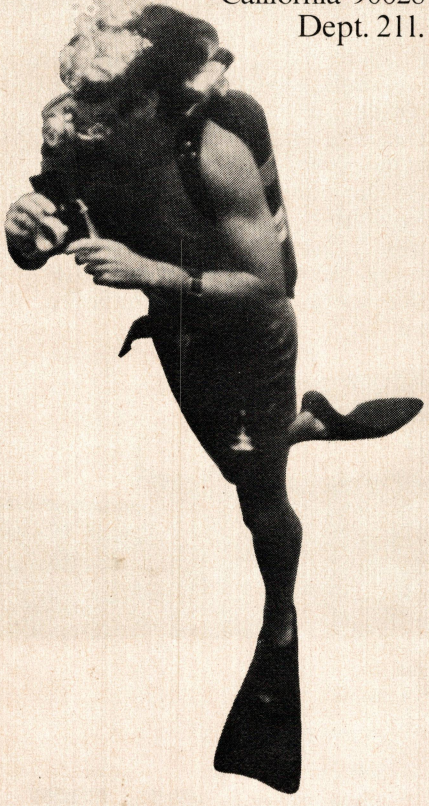
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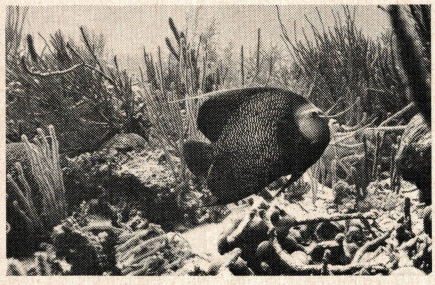
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DIVING SEE & SEA STYLE

See & Sea Travel has six action packed diving programs scheduled for 1974/75. First class adventures are planned in Cozumel, Bonaire, Cayman, Hawaii, the Galapagos and Australia, with Hawaii being their newest location. Carl Roessler will lead See & Sea's first group to Keauhou, Kona, June 10-17, where they will board the splendid *Fair Wind* to explore Hawaii's best. And ever-popular Cozumel will welcome 11 See & Sea trips in 1974. Peter Capen will lead the June 15-22 trip; Gene and Rosemarie Foster will lead the August 24-31 trip; Van Worley will



host the October 12-19 trip; and Ron Merker will be host November 23-30.

A trip which rivals Cozumel for popularity is diving off Paul Humann's *Cayman Diver* around Cayman. Twelve Cayman trips are planned for 1974. Leaders presently assigned are: Bill Leckie, May 25- June 1; Hank Ketels, June 8-15; Bernie Campoli, July 20-27; John Reseck, August 17-24; Rich Bergero, October 19-26; and John Kelly, November 2-9. A special *Cayman Diver* trip from September 7-18 is planned which will cruise from Grand Cayman to Roatan, with expedition diving along the way. The December 21-January 2 Cayman trip is a special holiday program for See & Sea divers, and the November 30-December 7 Cayman trip will be hosted by none other than Stan Waterman.

Bonaire diving is becoming more popular every year. See & Sea has seven Curacao/Bonaire trips scheduled for 1974 with Carl Roessler leading the May 18-26 trip, and John Kelly leading the July 6-14 trip. Dewey Bergman will host the full group going to the Galapagos June 26-July 13 of this year, and Stan Waterman will host the June 11-28 trip in 1975. The October 22-November 7 trip to Australia, to explore the exciting Great Barrier Reef, will be led by Bob Hollis.

During slack time, See & Sea owners Carl Roessler and Dewey Bergman will be exploring Tahiti, the Bahamas, Greece, Micronesia and Indonesia in quest of new diving adventures. For information and reservations contact: See & Sea Travel Service, 680 Beach St., Suite 340, San Francisco, Calif. 94109. Telephone: (415) 771-0077.

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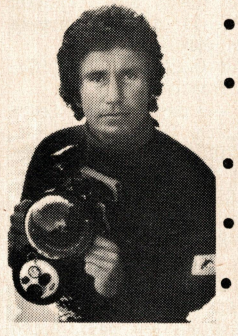
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DIVING IN ANTIGUA

The Marine Development Co. of Antigua, West Indies, recently accepted an appointment to manage the water sports operation for the Halcyon Cove Hotel on Antigua. The company has introduced a very extensive diving program for hotel guests, including expeditions to Antigua's protected underwater park where divers can photograph, feed or make a true friend with the tame fish found there.

Antigua has a barrier reef over 32 miles long, plus patch reefs, plateau reefs and 180 foot drop-offs. One mile from the beach are the remains of an old Spanish shipwreck, and not far away lie the remains of the *Warrior Geraint,* Captain Cousteau's research vessel in 1958. Night dives are made inside a 270 foot brigantine, *Andies,* which sank in 1904, and to visit a 250 pound grouper that lives inside a 75 foot ocean going tug boat that went down in 45 feet of water in 1969.

Marine Development has 40 scuba tanks and enough masks, fins, snorkels, regulators, safety vests and weight belts for 10 divers. They ask that clubs and large groups bring their own personal diving gear, plus equipment such as U/W cameras and lights for cave diving and night dives. The company has a new 12 cfm Mako compressor, plus a commercial air station on the island of Antigua. Its main diving boat is a 35 foot twin diesel vessel built especially for sport diving in Caribbean waters. In the summer, they also charter the 60 foot offshore racing ketch *Mimosa* for expeditions to Barbuda.

Special rates for groups of 10 or more divers are available from May 15 to November 15 at $27.50 per day, per diver. This includes hotel accommodations, two meals per day, plus four hours of diving daily. For more information, contact: Divemaster Dave Ferneding, Halcyon Cove, St. Johns, Antigua, West Indies.

RECOMPRESSION CHAMBER ON GRAND CAYMAN

Cayman Islands Divers Club has installed a 12 foot recompression chamber at the Cayman Clinic on Grand Cayman Island in the Caribbean. Until the chamber was installed, divers suffering from air embolism or decompression sickness around this popular diving area would have had to undergo a long trip by boat or low flying aircraft to the nearest recompression chamber in Key West, Florida.

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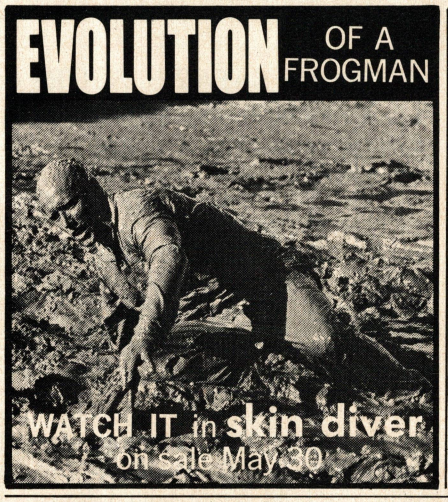
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DIVE NOVA SCOTIA

Dive Nova Scotia is the name of a free brochure distributed by the Nova Scotia Department of Tourism. The pamphlet lists some of the best dive sites along the several thousands miles of the province's coastline; gives the names, addresses and phone numbers of dive shops and boats available for diving charter, offers information about recompression chambers in the area; states fish and game regulations; and provides a list of skin and scuba diving organizations in Nova Scotia.

Nova Scotia is becoming an increasingly popular dive area because of its clean, clear water, interesting plant and marine life, and thousands of underwater shipwrecks. Other free publications divers might want to send for are: *Canada's Ocean Playground, Fish Nova Scotia's Fresh Waters, Fish Nova Scotia's Salt Waters, Campsites and Day-Use Parks,* or a *Highway Map.* Write to: Dept. DCI-Scuba, Nova Scotia Information Office, Suite 3115, 630 Fifth Ave., New York, N.Y. 10020.

ATLANTIS SAFARIS TOURS

Lee and Helen Turcotte, owners of Atlantis Safaris, Miami Shores, Florida, are leading two tours to beautiful Cayman Brac this summer. The coral reefs of Cayman Brac, and the spectacular drop-off at Jackson's Bite in Little Cayman, are thought to be some of the best diving in the world. The waters are still crystal clear, and there's plenty of fish life and underwater scenery for the photographer.

Dates for the 1974 Cayman Brac tours are June 15 to 22, and June 22 to 29. Price for the eight day, seven night trips is $398 which includes room (double occupancy), three full meals, transfers, all diving (including trips to Little Cayman, tanks, weight belts, back packs and air), beach parties, sightseeing, all taxes and gratuities. Round trip air fare from Miami to Cayman Brac is $104.

Another of Atlantis Safaris' many trips is scheduled for June 15 to 23, to Belize (British Honduras). This tour is a cruise, with accommodations aboard three boats, each with its own compressor, captain, mate and chef. The trip will include unlimited diving plus a dive in the Blue Hole, which was the subject of Jacques Cousteau's television special. Tour escort for this Belize trip will be Bob Clark of Colorado. The price is $599, which includes everything except gratuities. Air fare from Miami to Belize is $99 round trip.

For reservations on these trips, send a $50 deposit per person for the Cayman Brac trip, or $100 per person for the Belize trip, to: Atlantis Safaris, P.O. Box 303, Miami Shores, Fla. 33153.

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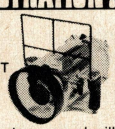
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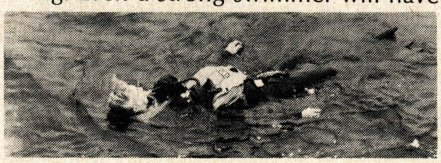


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NEW LIFESAVING FILM

A new 16mm film, entitled *Deep Water Rescue Breathing,* shows how to give air to an unconscious victim who has stopped breathing in an open water situation. Skin and scuba divers are most likely to be out so far that it would take more than four or five minutes to get to shore. If a non-breathing person is towed that long without getting air, it may be too late to revive him. The movie describes and demonstrates two methods of giving air while in the water: mouth to mouth, and mouth to snorkel.

The movie shows how a strong swimmer can give air mouth to mouth, preferably using fins and/or flotation. But, as the narrator says, mouth to mouth rescue breathing "without flotation or fins is difficult and very tiring. Even a strong swimmer will have



trouble giving more than a few breaths. And even with fins he can't make much progress toward shore. What the rescuer needs is some method of giving air without lifting his own head high out of the water.

"If a snorkel is available . . . even a weak swimmer can give rescue breathing and tow a victim to safety at the same time." Using mouth to snorkel, the rescuer can lie back in the water, relaxed, and blow air through the snorkel into the victim, keeping him alive while towing him with ease using his fins. Mouth to mouth rescue breathing has saved many lives on dry land. As deep water rescue breathing becomes part of standard rescue training, many more lives may be saved.

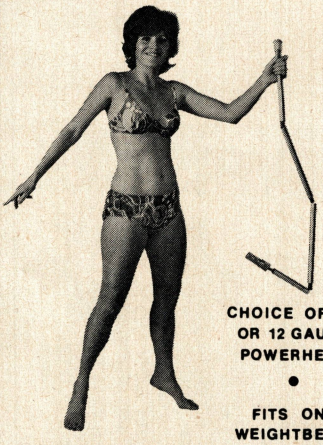
This instructional 11 minute, color, sound movie can be rented from Pierce Productions, 29 Harvard Street, Arlington, Mass. 02174 for $15 (deductible if purchased at $110).

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Robert E. Coate, national sales manager of Seamco Sporting Goods, recently announced the appointment of Floyd Erhard to his sales staff. Erhard will be responsible for the sales of Seamco's full line of sporting goods and Seamco/Nemrod diving equipment in the Oklahoma and Texas area.

Bringing to Seamco a wealth of sporting goods experience, Erhard has been with Healthways, Inc., served as sales manager of Sportsways, and most recently has been involved in the publishing business. Erhard and his wife, Irene, reside in Houston, Texas.

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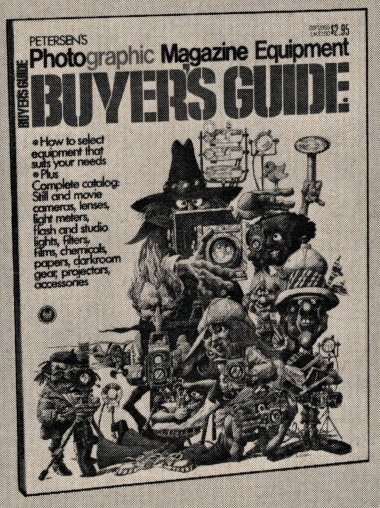
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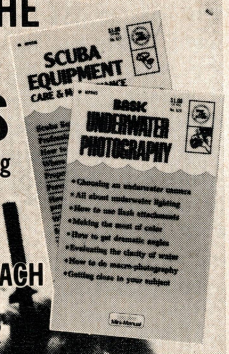
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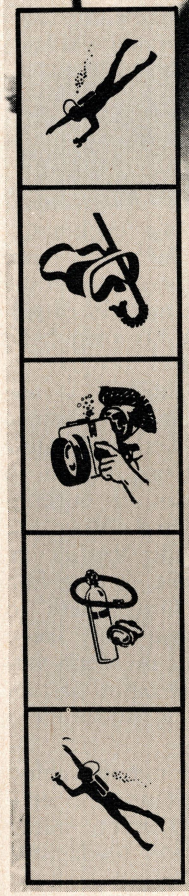
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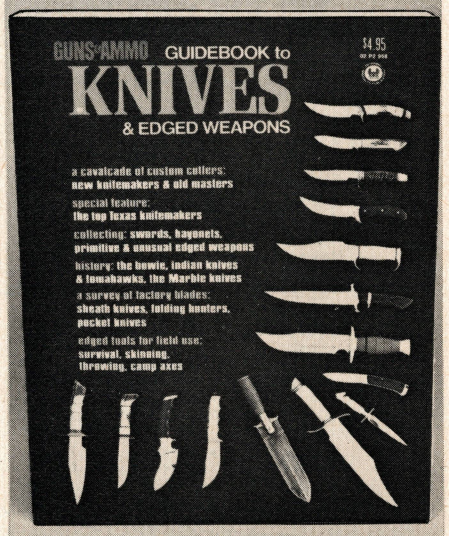
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SOCIETY OF U/W ENGINEERS

The Society of Underwater Engineers, of Hoboken, New Jersey, was formed in 1954, for the purpose of promoting sport diving among its members. It has the unique position of being affiliated with Stevens Institute of Technology, one of the nation's leading science and engineering colleges, and this involvement has given it access to superior instructors and advisors.

For instance, the Society sponsored certification course is taught by Professor Dratch, an accomplished diver whose experience has taken him all over the world. His course is the standard YMCA course as far as pool work is concerned, but during his theory sessions he takes advantage of the technical know-how of Stevens students and consequently goes into greater depth.

SUE's membership numbers about 40, with 18 persons enrolled in its YMCA certification course. The membership is primarily composed of students, but two members of the Stevens faculty have recently joined. They are Dr. Ralph Dratch, professor of mechanical engineering, and Dr. I. R. Lapidus, professor of physics. The club is funded by dues, membership fees and subsidies from the student council of Stevens Tech.

The club maintains ten complete sets of equipment, from wet suits to tanks and regulators, located in its equipment room aboard the *S.S. Stevens,* the dormitory ocean liner belonging to the school. The equipment is available to the active members at no charge during the academic year, and a student can rent a complete outfit of gear over the summer months for $35.

The club charters boats to investigate wrecks off the New Jersey and Long Island coasts, with the club financing the cost of the boats. In addition, the club sponsors dives to local lakes, quarries and inlets. SUE has also undertaken minor design and construction projects, such as a 65 page proposal to the National Science Foundation to study water pollution aspects of the upper Hudson River. The Society of Underwater Engineers is interested in forming an organization with other college dive clubs on a national level. Interested groups can contact them at Box 680, Stevens Tech, Hoboken, New Jersey 07030.

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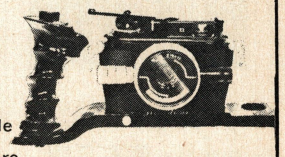
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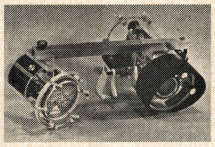
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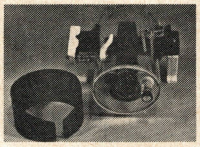


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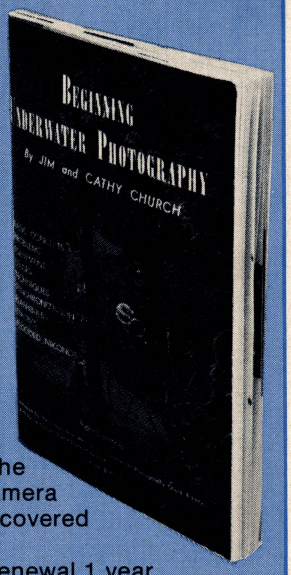
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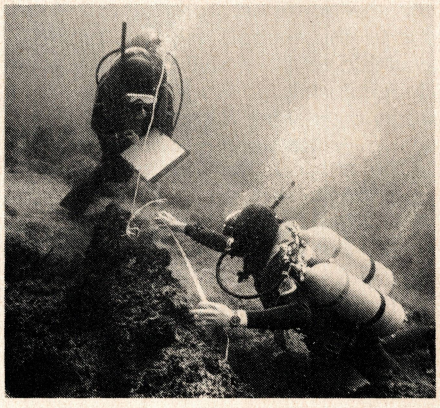
DRAKE'S LAST VOYAGE

British historian and maine archaeologist Sydney Wignall is about to embark on the Magnum Opus of a long and distinguished career in underwater exploration.

He got into the underwater field in 1955, after he had been arrested by the Chinese communists while leading a Welsh Himalayan expedition to the border of Nepal and Tibet. After two months brain washing he emerged from his cell, crossed the central Himalaya in the depths of winter, turned his back on high altitude exploration, bought a scuba set, and thereafter devoted his time to marine archaeology.

In 1968, his Spanish Armada Marine Archaeological expedition located, off the west coast of Ireland, one of the most famous of the 1588 Spanish Armada flagships, the *Santa Maria de la Rosa*. For the excavation of that wreck, His Royal Highness Prince Philip presented Wignall with the Duke of Edinburgh annual gold medal for underwater scientific achievements. In 1970, he and colleague Colin Martin located another Spanish Armada flagship of the year 1588, *Gran Grifon*, wrecked off Fair Isle, Scotland.

Examination of the cast iron shot from both Armada wrecks led Wignall to pose, at an international symposium held at Bristol University, that the Spanish Armada failed to beat the English not because of any alleged but unproven shortcomings in Spanish



leadership, seamanship or gunnery, but because of the poor quality of the Spanish cast iron shot which disintegrated on striking the sides of Queen Elizabeth the First's royal galleons. Examination of English, Spanish, Dutch and other archives tended to support Wignall's theory. His standpoint was later vindicated by Dr. W. H. F. Tickle, a metallurgist of the British Steel Corporation who fully supported Wignall's hypothesis.

In 1972, Wignall led the International Marine Archaeological Expedition to the Azores, where his team of divers

located and raised the largest bronze gun ever found in the sea.

Wignall, who has described himself on television as a 'little boy who never grew up,' also asserts that a spirit of romance and adventure is lacking today, and that he regards every expedition as a voyage of adventure and discovery. His reputation is such that every year he has to turn away over a hundred young volunteers who want to join his expeditions.

Wignall's latest expedition is Marine Archaeological Project Panama. Staffed by six nationalities, with the physical support of departments of two American, two British, one Scots and one Welsh university, his team of young scientists will search the Caribbean coast of Panama for several shipwrecks of historical importance which he has researched over the years. These include a Columbus caravel, two of Queen Elizabeth the First's royal ships, several of Philip II's royal ships, a French privateer filled with stolen Spanish coin, and the flagship of English master thief and pirate Sir Henry Morgan. Wignall and his associates have already located two of the above wrecks, and he says that he knows where the rest are within a few hundred yards. His main essay will be to retrace Drake's last voyage to the Spanish Main of 1595/6. He knows where some of Drake's shipwrecks are but will not divulge their location.

Treasure hunting is not on Wignall's agenda. The Council for Nautical Archaeology of Great Britain, which represents such august bodies as the British Museum, Tower of London and the National Maritime Museum, has given Wignall's scientific/historical and archaeological program its blessing. The two Panama authorities concerned have welcomed his proposals and letters of intent confirm Wignall's wish for 'Area Exclusivity' to prevent encroachment by intruders.

A university will publish the 100 page scientific report. Scientists taking part include Professor Harold Edgerton of Massachusetts Institute of Technology with his Sub Bottom Profile Sonar; Dr. Tom G. Muir of the Applied Research Laboratories of the University of Texas at Austin, with a newly developed underwater wreck detector Parametric Sonar; and Dr. E. T. Hall, Director of the Research Laboratory for Archaeology of Oxford University, with a powerful Proton Magnetometer.

A book will be published simultaneously in the U.S.A. and Great Britain. Wignall, whose T.V. films have now been screened in 26 countries will be producing an initial series of four one-hour color prestige T.V. underwater films for world-wide distribution.



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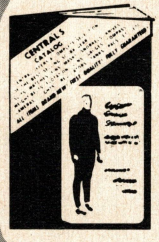
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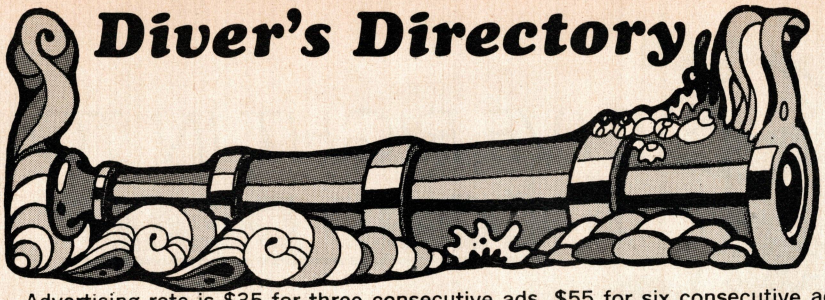


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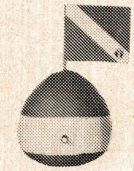
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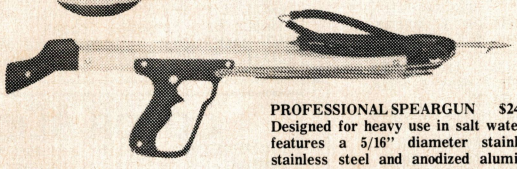
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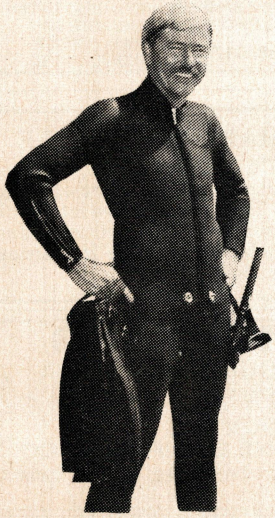
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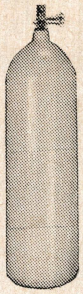
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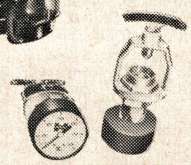
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